Determinants and Consequences of Executive Compensation: Empirical Evidence from Chinese Listed Companies

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Abstract

The objective of this study is to provide a more comprehensive understanding of executive compensation plans in China. On one hand, it examines the determinants of compensation practices by supplementing the classical principal-agent theory with tournament theory and managerial power theory. On the other hand, it tests whether the adoption of equity-based compensation delivers better company performance for Chinese listed companies.

Using compensation data from Chinese listed companies between 2006 and 2011, it is found that compensation level is strongly aligned with accounting-based performance. In particular, compensation and performance are more aligned at the higher hierarchical level. In addition, the level of compensation significantly rises with hierarchical level. It is also found that companies with the presence of the remuneration committee tend to use performance-based compensation. However, compensation and performance are less aligned when the size of the remuneration committee is smaller, and when the proportion of insiders on the remuneration committee is higher. Finally, it is found that company accounting-based performance is improved one year after adopting equity-based compensation.

This study offers the following practical implications for policy makers and other practitioners. First of all, the board of directors and its remuneration committee should take account of market-based performance, as well as equity-based compensation, when designing compensation contracts for executives. In addition, policy makers may follow developed countries in implementing legal compulsion for constructing a remuneration committee through enacting laws. Finally, a clear and strong legal support for the appropriate composition and size of the remuneration committee is needed, in order to prevent the decision-making processes of this committee from being influenced by managerial power.

List of Abbreviations

Abbreviation	Full Name
2SLS	Two-stage Least Squares
ATT	The Average Effect of Treatment on the Treated
CARs	Cumulative Abnormal Returns
CFI	China Finance Information
CEO	Chief Executive Officer
CFO	Chief Finance Officer
CMRS	Contract Management Responsibility System
CSR	Corporate Social Responsibility
CSRC	China Securities Regulatory Commission
DID	Difference-in-difference
FE-2SLS	Fixed-effect Two-stage Least Squares
IRS	Internal Revenue Service
IV	Instrumental Variable
NJTC	Nanjing Tanker Corporation
NPC	National Peoples' Congress
OECD	Organisation for Economic Co-operation and Development
PPS	Pay for Performance Sensitivity
PSM	Propensity Score Matching
SEC	U.S. Securities and Exchange Commission
SOEs	State Owned Enterprises
SSE	Shanghai Stock Exchange
SZSE	Shenzhen Stock Exchange
VIF	Variance Inflation Factor
WTO	World Trade Organization

Chapter 1: Introduction

"… being the managers rather of other people's money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company".

-Adam Smith, 1776[1]

1.1 Introduction

As an important corporate governance approach to mitigate the interest-conflicts between executives and shareholders, mainly resulting from the separation of ownership and control, executive compensation has always been a hot topic which captures significant attention of policy makers, researchers, media and the public around the world. In particular, the global concern over the efficiency of corporate governance mechanisms such as the compensation scheme has risen considerably due to the more frequent occurrence of high profile bankruptcy and scandals of large companies during the past few decades. For instance, it has been argued that one of the weak corporate governance arrangements leading to the bankruptcy of Lehman Brothers in 2008 is an inappropriate remuneration scheme. Specifically, even the firm has announced that it lost about four billion dollars in the third quarter; Richard Fuld, CEO and Chairman of the Lehman brothers, was awarded a total compensation of nearly 500 million dollars just four days before its bankruptcy (Bebchuk, Cohen, & Spamann, 2010). Disquiet over inappropriate pay arrangements is increasing in both developed countries as well as in emerging markets. For example, NJTC[2], one of largest shipping companies in China, was delisted in 2014 due to the consecutive losses during 2010-2013. However, executive compensation in NJTC experienced sustained growth between 2010 and 2013 (Wei, 2014).

[1] Smith, A. (1776). The Wealth of Nations. London: W. Strahan and T. Cadell.
[2] Nanjing Tanker Corporation

Emerging markets have been playing significant roles in developing the global economy. Emerging markets also face the problem of interest-conflicts resulting from the separation of ownership and control as they have been constructing modern corporations following developed countries. However, emerging economies normally have large state ownership (Shleifer & Vishny, 1997), weak laws as well as underdeveloped capital markets (Goergen, 2012), in contrast to developed countries. Therefore, it is important to investigate how companies in emerging markets implement financial incentives for their executives and to test the generalisability of influential theories in developed countries in the context of emerging markets.

Academic research on executive compensation has experienced a long history. Existing literature on executive compensation appears to focus mainly on Anglo-Saxon capitalism, although studies outside the U.S. and the U.K. are strongly encouraged (Rosen, 1990; Sun, Zhao, & Yang, 2010). This study aims to provide a more comprehensive understanding of executive compensation in China, one of the largest emerging markets in the world.

The purpose of this chapter is to provide a clear introduction to this study. Specifically, section 1.2 describes the research background and motivation. The research questions are clarified in section 1.3, and section 1.4 discusses the contributions of the current study. Finally, as the conclusion section, section 1.5 briefly summarises this chapter and clearly outlines the structure of the whole thesis.

1.2 Research Background and Motivations

The interest-conflicts resulting from the separation of ownership and control has been introduced by Adam Smith in his noted book, "*The Wealth of Nations*" as early as 1776. The issue of interest divergences due to the separation of ownership and control in modern corporations was then highlighted by Adolf Berle and Gardiner Means in 1932. In their book named "*The Modern Corporation and Private Property*", Berle and Means (1932) argue that the control of corporations has become increasingly separated from their ownership, and self-seeking controllers may serve their own pockets at the expense of the company. The problem that controllers pursue their own benefits rather than the best interests of the owners is typically denominated as moral hazard. In particular, the asymmetric information between the controllers and the owners provides a prior condition for the existence of moral hazard (Holmström, 1979).

The interest-conflicts in the control-owner relationship are further theorised by Michael Jensen and William Meckling in 1976. They construct the classic principal-agent theory, where the principal and agent represent owners and controllers respectively. In modern corporations, the principals are normally referred to as shareholders, and the agents are usually denominated as executives. The principal-agent model provides remedies which could potentially alleviate the interest-conflicts between the shareholders and executives. On one hand, performance-based executive compensation is viewed as a financial incentive to motivate executives to maximise shareholder value as it aligns executives' interests with those of the shareholders (Jensen & Meckling, 1976). On the other hand, internal corporate governance mechanisms play important monitoring roles in mitigating the principal-agent problem (Holmström, 1979).

In fact, studies on executive compensation date back to at least 1925 when Taussig and Barker investigated executive compensation in American corporations through questionnaires. The modern history of executive compensation studies started in the 1980s and followed the principal-agent theory (Murphy, 1999). Based on the principal-agent theory, most literature has been focusing on whether compensation has been positively linked to company performance to provide appropriate financial incentives for executives to work for the best interests of shareholders (e.g. Murphy, 1985; Jensen & Murphy, 1990; Conyon & Murphy, 2000), and whether compensation and monitoring by the board of directors or shareholders jointly mitigate agency problems (e.g., Core & Guay, 1999; Conyon & He, 2012).

The principal-agent theory, although conceptually important, has provided limited empirically testable insights into the hierarchical structure of compensation for the organisation as a whole (Lambert, Larcker, & Weigelt, 1993). Therefore, later studies have attempted to extend the classic principal-agent theory by considering the role of position hierarchy in determining executive compensation. In particular, the tournament theory provided by Lazear and Rosen (1981) offers empirically testable predictions on how compensation varies with executive hierarchical levels within the company. In addition, the weak pay-performance relation and the limitation of classic principal-agent theory motivate researchers to start to provide alternative views on incentive compensation. An influential view is the managerial power theory by Bebchuk and Fried (2003), who argues that as executives may achieve rent extractions through using their power to influence pay settings made by the board of directors or the remuneration committee, compensation is a part of the agency problem rather than an approach to

alleviate agency problems. Although a growing number of studies attempt to combine different theories in order to provide a more comprehensive understanding of executive compensation (e.g. Lambert, Larcker, & Weigelt, 1993; Conyon & He, 2004; Chen, Ezzamel, & Cai, 2011), the majority of literature still lays is rooted in the standard principal-agent theory. In addition, an interesting number of researches have been focusing on the design of compensation not just the amount of compensation (e.g. Yermack, 1995; Anderson & Bizjak, 2003; Jensen & Murphy, 2010). However, executive compensation literature in regions outside developed countries is still quite uneven (Boyd, Franco Santos, & Shen, 2012).

As one of the largest emerging markets around the world, China started its economic reform since 1978. The rapid development of economy in the past few decades has made China become the second largest economy in the world. In the process of economic reform, China has been establishing a modern corporate system. This raises an important question as to whether executives in Chinese listed companies have been provided appropriate incentives such as performance-based compensation, in order to alleviate the agency problem in the modern corporation.

In addition, executives at Chinese listed companies are selected by the board of directors or its sub-committee on the basis of executives' business experience and performance record. They are allocated into different levels of seniority, and have opportunities to be promoted to higher hierarchical levels via internal labour market contests. Therefore, it is important to explore how executive compensation varies with hierarchical levels.

Moreover, Chinese listed companies are gradually converging to the "best practice" corporate governance models, such as establishing the remuneration committee (Conyon and He, 2012). Increasingly more Chinese listed firms have established remuneration committees following the "*Code of Corporate Governance for Listed Companies*", especially after introducing the "*Notice on the Matters concerning Carrying out a Special Campaign to Strengthen the Corporate Governance of Listed Companies*" by the China Securities Regulatory Commission (CSRC) in 2007. This raises important questions as to whether the remuneration committee plays an effective role in setting appropriate compensation for executives, in order to optimise the interests of shareholders, or whether its decisions on compensation plans are influenced by managerial power.

Finally, following developed countries such as the U.S. and U.K., Chinese listed companies have been using equity-based compensation to motivate its executives since 2006. As suggested by Conyon and He (2012), the lack of equity-based compensation in the past and their emergence from 2006 provides a good opportunity to test whether an equity-based incentive indeed aligns the interests of executives and shareholders and leads to improved future performance.

1.3 Research Questions

This study aims to explain executive compensation in Chinese listed firms. On one hand, the main objective of this study is to examine the determinants of compensation plans by supplementing the classical principal-agent theory with insights gained from the tournament theory and the managerial power theory. Specifically, the standard principal-agent theory is applied to develop hypotheses regarding the relation of compensation level and company performance, and the role of a remuneration committee in setting executive compensation. In addition, hypotheses related to the impacts of hierarchical levels on executive compensation are based on tournament theory, while the managerial power theory is devoted to generate hypotheses in relation to the influences of the proportion of insiders serving on the remuneration committee, and the size of the remuneration committee on executive compensation plans. On the other hand, this study explores the causal effects of adopting equity-based compensation on company performance, based on the standard agency theory. Specifically, this study focuses on the following related questions:

- First of all, has executive compensation been positively linked to performance in Chinese listed companies, as predicted in principal-agent theory literature?

- Moreover, how does hierarchical level influence compensation level, pay-performance link, and the likelihood of receiving equity-based compensation?

- Thirdly, does the presence of the remuneration committee affect compensation level, pay-performance link, and the likelihood of receiving equity-based compensation in Chinese listed companies?

- Furthermore, how does managerial power, represented by remuneration committee size and the proportion of insiders on the remuneration committee,

influence compensation level, pay-performance link, and the likelihood of receiving equity-based compensation?

- Finally, does the adoption of equity-based compensation produce better future performance for Chinese listed companies?

1.4 Contribution to Knowledge

This study contributes to the executive compensation literature in different ways. First of all, it examines the executive compensation in emerging markets, given the large amount of literature focusing on developed countries such as the U.S. and the U.K. Studies in the context of regions outside developed countries enhance the literature to explore whether executive compensation globalises along the lines of developed countries (Cheffins, 2003; Conyon and He, 2012). In particular, the unique corporate governance and the evolution of executive compensation during the economic reform in China motivate this study to select samples from China, one of the largest emerging markets in the world.

In addition, this study supplements the classic principal-agent theory with the knowledge gained from the tournament theory and the managerial power theory, in order to provide a more comprehensive view of the determinants of executive compensation in Chinese listed companies. This is different from most previous literature relying on a single theory. First of all, the principal-agent theory provides the theoretical foundation for hypotheses related to the relation of compensation level and company performance, and the influence of the presence of the remuneration committee on compensation plans. In addition, the tournament theory is employed to explore the effect of hierarchical levels on executive compensation. Finally, the managerial power theory is applied to generate hypotheses in relation to the influence of the composition and the size of the remuneration committee on compensation plans. Empirical findings in this study suggest that executive hierarchical levels, the presence of the remuneration committee, the proportion of insiders serving on the remuneration committee, and the remuneration committee size indeed do play important roles in determining executive compensation plans in China.

Another contribution of this study is that it sheds light on the role of the remuneration committee in designing executive compensation in China. Prior literature in the context of developed countries has empirically suggested that the remuneration committee plays

an important role in designing executive compensation (e.g. Main & Johnston, 1993; Conyon & Peck, 1998; Sun & Cahan, 2009). However, the influences of the remuneration committee on compensation plans are typically ignored by previous Chinese literature with the exception of Zhu, Tian, and Ma (2009) and Conyon and He (2011; 2012). This study makes novel contributions through examining the impacts of the presence of a remuneration committee on pay structure. It also contributes to the literature by testing the influences of the proportion of insiders and the total number of directors serving on the remuneration committee on pay practices in China from the managerial power perspective.

Moreover, this study involves equity-based compensation which has been omitted by most prior literature in the context of China with the exception of Conyon and He (2012). Conyon and He (2012) estimate the influences of a set of corporate governance mechanisms on the propensity of receiving equity-based compensation for CEOs in Chinese listed companies. This study uses a dummy variable to measure the adoption of equity-based compensation grants following Conyon and He (2012). However, it differs from Conyon and He (2012) in the following aspects:

- It extends the sample to multi-level executives;
- It makes a novel contribution by empirically testing how the likelihood of receiving equity-based compensation varies with hierarchical levels;
- It also makes a novel contribution by estimating the role of managerial power in determining the likelihood of receiving equity-based compensation.

To the best of my knowledge, this is the first study on the influences of hierarchical levels and managerial power on the likelihood of receiving of equity-based compensation in China.

In addition to the determinants of equity-based compensation, this study also contributes to the literature by testing the causal effects of adopting equity-based compensation on company performance in China. As far as I'm aware, this is also the first study which combines the propensity score matching method with the difference-in-difference regression to test whether adopting equity-based compensation produces better performance.

Furthermore, this study employs compensation data of individual executives through taking advantage of the improved pay disclosure system in China. Earlier Chinese compensation literature usually measures executive compensation as the average of the top three highest-paid executives, due to the weak pay disclosure system. However, this approach might result in a biased estimation of the pay and performance relationship as it cannot control the effects of individual managerial attitudes (Conyon & He, 2012). In particular, highly paid executives might change over time and they may have different individual effects.

Seventhly, the sample included in this study consists of both the CEOs and non-CEO executives. Prior literature focusing on CEOs alone is not comprehensive as firms are operated by the executive team, and thereby have limited explanatory powers for overall pay practices of executives. Including non-CEO executives also allows this study to estimate how the level and structure of pay varies within the executive team. Yet again, to the best of my knowledge, this is the first study on the variation of compensation structures across executive position hierarchies within Chinese listed firms.

Finally, one important methodological contribution of this study is the use of the fixed-effect two-stage least squares (FE-2SLS) instrumental variables (IV) estimator. An advantage of this method is that it accounts for endogeneity of company performance, as well as correlated unobserved heterogeneity (Semykina & Wooldridge, 2010). Previous studies on the influences of performance on executive compensation typically ignore the potential endogeneity of company performance. However, in Buck, Liu, and Skovoroda (2008), it is found that executive compensation and company performance mutually affect each other, suggesting that simply regressing compensation on performance without considering the endogeneity of performance might produce biased results.

1.5 Structure of the Thesis

This Chapter starts with an overview of the research background and motivations, followed by an outline of the research questions and a summary of contributions. The remaining of this thesis is organised as follows:

Chapter 2 offers a proper understanding of the institutional background for this study. Specifically, it describes the Chinese economic reform with an emphasis on the evolution of corporate governance and executive compensation in the process of reform.

It also identifies the features and problems of the current corporate governance system in China.

Chapter 3 reviews prior theoretical and empirical literature in the field of executive compensation. In particular, it reviews three important theories in developing hypotheses in this study, namely the classical principal-agent theory, the tournament theory, and the managerial power theory. It then reviews empirical literature with reference to the pay-performance relationship, the influences of position hierarchy on pay practices, the role of the remuneration committee in designing pay settings and the effects of equity-based compensation on performance, in the context of both China and developed countries.

Chapter 4 focuses on the research methodology and hypotheses in this study. It starts with the research philosophy, and then identifies that this study employs the deductive approach, the quantitative method and longitudinal secondary data. Next, it then develops a set of hypotheses based on the principal-agent theory, the tournament theory, and the managerial power theory, and presents a range of models utilised to test these hypotheses. This is followed by an identification of potential econometric issues and appropriate estimators. Finally, this chapter provides a description of variables and summarises sample selection in this study.

Chapter 5 presents and discusses empirical findings regarding the relation of pay and performance in the context of China. It starts with the descriptive statistics for executive pay, company performance, managerial attributes, firm attributes and economic characteristics, and corporate governance characteristics during the sample period, followed by a correlation matrix for key variables. The VIF tests are also presented, before discussing regression results, in order to identify whether independent variables suffer from a potential collinearity problem. It then compares empirical evidence on pay-performance relation obtained from the fixed-effect two-stage squares (FE-2SLS) estimator, with the normal ordinary least squares (OLS) regression and the standard fixed-effect (FE) regression, and relates findings to previous literature.

Chapter 6 focuses on empirical analysis of the influence of hierarchical levels on executive compensation in Chinese listed companies. Similarly to Chapter 5, it presents descriptive statistics at the beginning. VIF tests are also reported before analysing regression results. It then reports and discusses empirical findings in relation to the

influence of hierarchical levels on compensation level, pay-performance link, and the likelihood of receiving equity-based compensation.

Chapter 7 places emphasis on the role of remuneration committee in determining executive compensation in China. Like Chapter 5 and Chapter 6, both descriptive statistics and VIF tests are reported before analysing the regression results. The regression results could be divided into two parts based on theoretical foundations. On one hand, based on principal-agent theory, this chapter discusses empirical evidence on the influence of remuneration committee presence on the level of pay, pay-performance link, and the likelihood of receiving equity-based compensation. On the other hand, from a managerial power perspective, this chapter analyses how the pay level, pay-performance relation, and the likelihood of receiving equity-based compensation vary with the proportion of insiders and the total number of members serving on the remuneration committee.

Chapter 8 pays close attention to empirical results in relation to the causal effect of the adoption of equity-based compensation on company performance in Chinese listed companies. Like chapter 5, this chapter starts with descriptive statistics for a matched sample by propensity score matching (PSM), followed by a correlation matrix for key variables and VIF tests for independent variables. It then reports and discusses empirical results gained from the difference-in-difference (DID) regression.

The thesis ends with chapter 9, the conclusion chapter. This chapter restates the research questions and contributions of this study. It also summarises empirical findings which have been presented in previous chapters. Based on these findings, this chapter provides some academic and practical implications which may potentially enhance research and practice of corporate governance and executive compensation in both China and perhaps other emerging markets, for researchers, policy makers, the board of directors, the remuneration committee, and other practitioners. Finally, it highlights limitations of the current study and provides suggestions for future research.

Chapter 2: Institutional Background

"China's reform and development will bring more business opportunities to the world."

-Li Keqiang, Premier of the People's Republic of China, the World Economic Forum, January 21, 2015[3]

2.1 Introduction

China's economic reforms since 1978 have been experimental and gradual (Morck & Yeung, 2014). China has gradually transformed from a centrally planned economy to a market economy through a series of reforms taken by the government. During the transition period, corporate governance in China has emerged and pullulated (Organization for Economic Co-operation and Development [OECD], 2011), and the role of executive compensation in providing financial incentives for executives in Chinese listed companies becomes more and more significant.

Chapter 2 aims to draw a picture of the institutional background related to economic growth, corporate governance framework and executive compensation in China. The rest of this chapter is organised as follows. Section 2.2 divides the history of Chinese economic reform into five phases, and reviews the development of corporate governance and the evolution of executive compensation in the process of economic reform. Section 2.3 offers a proper understanding of the current corporate governance model in China. Specifically, it explores the special board structure, the role of remuneration committees in determining executive compensation, and the power of the independent directors. Section 2.4 reviews the components of a typical executive compensation package in Chinese listed companies, and discusses the current problems associated with executive compensation in China.

2.2 The Development of Corporate Governance and the Evolution of Executive Compensation in China

China has gradually transformed from a 'planned economy' to a 'market economy' during the past few decades. During the economic reform, Chinese enterprises have

[3] Li Keqiang, Premier of the People's Republic of China delivers a speech during the plenary session 'The Global Impact of China's Economic Transformation' during the Annual Meeting 2015 of the World Economic Forum in Davos, January 21, 2015.

successfully evolved from government affiliates to modern corporations, corporate governance in China has emerged and developed, and executive compensation has become to be one of the major incentives for executives in Chinese listed companies (OECD, 2011). In general, the history of Chinese economic reform, together with the development of corporate governance and the evolution of executive compensation embedded in the process of reform, can be divided into at least five phases.

2.2.1 Phase I: Before 1978

Before the 1978 Chinese economic reform, all of the economy's activities were centrally planned and controlled by the state rather than the market. For instance, the government planned the production objectives, product type and product prices centrally for the companies, based on the macro economy plans. Corporate business performance was measured by the number of planned targets met instead of the market value (OECD, 2011).

In this 'planned economy', companies were called 'state owned enterprises (SOEs)' as they were owned and operated by the state. The SOEs were characterised by their 'administration-driven, unified and collective governance' (OECD, 2011). Managers of these SOEs were nominated and dismissed by government agencies, and their achievements were evaluated by the enterprises' performance in satisfying the plans made by government agencies rather than the SOEs' financial performance (Schipani and Liu, 2002). Executives' compensation was mainly based on their qualification and ranks but unrelated to business performance. In addition, pay differences across hierarchical levels were extremely small (Lin, Shen, & Su, 2011). Therefore, executives were motivated by political entitlement (OECD, 2011), and there was a lack of financial incentives for them to improve business performance (Bai, Lu, & Tao, 2006).

2.2.2 Phase II: From 1978 to 1983

The second phase was characterised by decentralisation (OECD, 2011), which was motivated by promoting markets and gradually phasing out the central planning function by the government (Fan, Wong, & Zhang, 2007). The decentralisation started with the Chinese economic reform launched by The Third Plenum of the Eleventh Central Committee of the Communist Party of China in 1978. This reform aimed at gradually relaxing the role of the government central planning, introducing a free market system and various kinds of profit-sharing schemes, and increasing decision

making autonomy granted to SOEs (Huang & Duncan, 1997). In the process of decentralisation, the state's direct control over SOEs was supplemented with economic incentives (OECD, 2011), and SOEs' executives were released more autonomies. For example, SOEs were allowed to retain 3% of their profits as the economic incentives to improve productivity and efficiency (Sun & Tong, 2003).

2.2.3 Phase III: From 1984 to 1992

Separation of state ownership and SOEs management was the core of this phase. The idea of separating SOEs management and state ownership was proposed for the first time in 1984 (OECD, 2011), and it was implemented through SOEs reform. As the major part of economic reform in this phase, SOEs reform aimed at making SOEs enjoy full management authority and full responsibility for their own gains and losses in the market (Schipani & Liu, 2002), thus providing a more effective incentive scheme for managers in Chinese companies (Naughton, 1994).

From 1987, the government implemented the Contract Management Responsibility System (CMRS) in most SOEs. In the CMRS, a typical contract sets up negotiated profit-sharing rules between the management team and the government (Kang, Shi, & Brown, 2008). In other words, the government gave SOEs a free hand to run their operations, while SOEs had to promise a certain amount of tax to the government in return (Sun & Tong, 2003). Specifically, the government stipulated specific targets (e.g. profitability) in the contract, and managers of the SOEs are committed to fulfil the targets (Choe & Yin, 2000). Managers could be either awarded with a bonus or punished with a penalty, depending on SOEs performance. For instance, the manager would share the above-target profit with the government at a fixed rate in the contract if the realised profit exceeded the profit target[4], or the manager had to pay a penalty[5] if the target was not met.

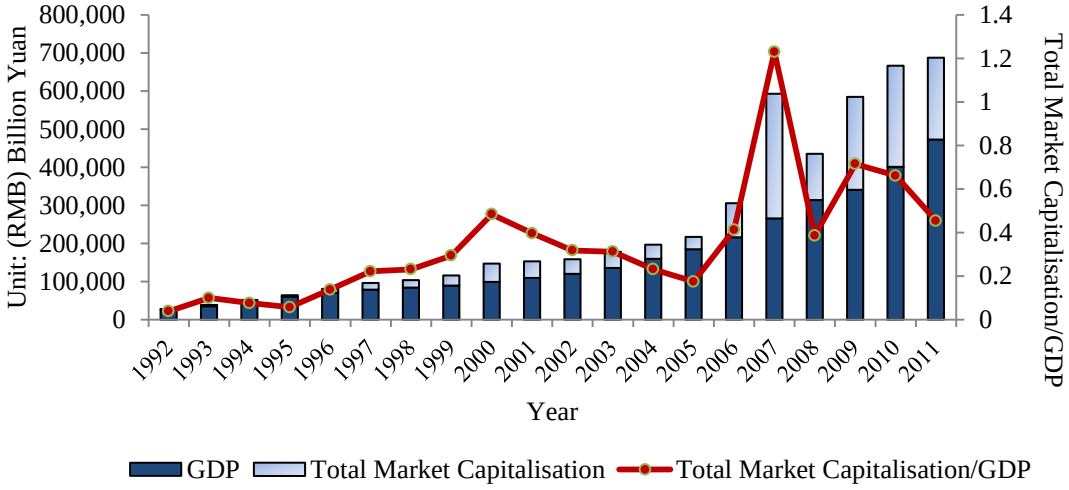
The CMRS played a positive role in China in the process of transforming from a planned economy to a market-based economy (OECD, 2011). For instance, it resulted in a stable increase in marginal profit retention rates over the 1980s (Groves, Hong, McMillan, & Naughton, 1995). In addition, managers had been given considerable

[4] If the realised profit exceeds the profit target subject to certain restrictions on fixed capital depreciation and total wage payment (Choe & Yin, 2000).

[5] The penalty is either fixed or an amount proportional to the difference between the target and realised profit, or the performance bond forfeited (Choe & Yin, 2000). Normally, the penalty should be no more than a half of the annual salary of the managers (Groves et al., 1995).

freedom and autonomy in operating SOEs (Kang et al., 2008). However, the CMRS was also associated with some limitations. First of all, it had been widely observed that the manager would normally blame external factors such as bad market conditions and bargain with the government to soften the penalty if the profit target was not met, so there was no doubt that this "soft penalty" phenomenon undermined managerial incentives (Choe & Yin, 2000). Moreover, the CMRS could not avoid the short-term performance oriented behaviours (OECD, 2011).

Figure 2.1: Annual GDP and Total Market Capitalisation, 1992-2011



Data Source: National Bureau Statistics of China

The Shanghai Stock Exchange (SSE) was established in China in December 1990, followed by the Shenzhen Stock Exchange (SZSE) in April 1991. Both of them have been growing fairly quickly (Allen, Qian, & Qian, 2005). Figure 2.1 above represents the stock market growth and the economic growth in China. The figure shows that there has been a sustainable growth of GDP in China between 1992 and 2011, and there has been a significant increase of the aggregate value of the stock market since the mid-1990s. In addition, although the ratio of aggregate market value and GDP undulated during the period 1992-2011, it showed an overall increase. Specifically, the ratio has increased by 41.52 percent by the end of 2011, comparing with the ratio in 1992. This indicates that the stock market plays an important role in contributing to the economic growth in China.

Known as the official regulatory institution to monitor the stock market, the China Securities Regulatory Commission (CSRC) was set up in 1992. Also in this year, the fourteenth National Peoples' Congress (NPC) brought the goal forward to build up

socialism market economy, and thus accelerated the speed of shifting from 'planned economy' into 'market economy'.

Executive compensation also experienced a reform in the process of SOEs reform. In particular, the government introduced several relevant policies to encourage performance-based compensation. In 1985, the State Council of the People's Republic of China issued "*Notification about State-owned Enterprise Salary Reform*" (hereinafter, "*Notification*"). The "*Notification*" stipulated that salary should be floated in proportion to enterprise performance. In the same year, the Ministry of Labour and Social Security (MOL) decided that wages would be linked to SOEs' economic performance measured by enterprise profitability or a combined indicator of economic returns (Yueh, 2004), in order to promote managerial incentives.

In prior literature, it has been found that the improved managerial incentive system has effectively enhanced the performance of SOEs. Groves et al. (1995) suggest that SOEs' productivity was positively driven by introducing managerial incentives in the 1980s. Li (1997) demonstrates that the improved managerial incentive is one of the important factors resulting in the total factor productivity growth in China in 1980s. Firth, Fung, and Rui (2006) also demonstrate that management incentive schemes have gained a toehold. However, Choe and Yin (2000) argue that the reform of SOEs in China did not effectively provide incentives for SOEs' managers to maximise profits as firms faced an extremely uncertain macroeconomic environment in the transitional period (Choe & Yin, 2000).

Kato and Long (2006) argue that substantive executive compensation reforms in Chinese SOEs did not really start until the pilot implementation of the annual compensation system in 1992. Shanghai was the first city which adopted the pilot annual compensation programme, followed by 100 large SOEs around the country. Annual compensation then became prevalent in China. There were two components included in the annual compensation: a fixed basic salary and a floated compensation. The former depended on the average wage of ordinary employees and the size of the enterprise, and the latter depended on the performance of the firm in the year (Kato & Long, 2006). It is worth noting that the State Council has permitted enterprises to establish their own wage structures within the overall wage budget controlled by the government since 1992.

2.2.4 Phase IV: From 1993 to 2003

This phase was characterised with SOEs privatisation and establishing a modern enterprise system. Developed countries experiences have shown that share issue privatisation plays an important role in the success of SOEs privatisation (Megginson & Netter, 2001). Thus, a large number of Chinese SOEs went into the process of privatisation through selling their shares to the public on either SSE or SZSE (Firth, Fung, and Rui, 2007). Figure 2.2 below describes the annual number of Chinese listed companies and its annual growth during the period 1991-2011. The number of listed firms significantly increased from only 13 in 1991 to 2,342 in 2011, as shown in Figure 2.2.

Figure 2.2:
Annual Number of Listed Firms, 1991-2011

Date Source: China Finance Information (CFI) Data Engine

In 1993, the government issued the "*Companies Law of the People's Republic of China*" (hereinafter, "*Companies Law*") in order to monitor the listed firms and to maintain the stock market. As the first comprehensive law that fully stated the rights and responsibilities of modern companies in China (Kang et al, 2008), the "*Companies Law*" provided a legal foundations to establish a modern enterprise system (OECD, 2011). The Company Law also played an important role in building up the corporate governance system in China. Chinese listed firms established the shareholders' meetings, the board of directors, the supervisory board and the senior management team, according to the requirement of the "*Company Law*".

Although the government had made efforts to transform the traditional SOEs to modern corporations with the support of the "*Company Law*", the corporatised SOEs still faced a lot of corporate governance problems. For instance, Schipani and Liu (2002) argue that the excessive overlaps between directors and executives lead to insider control and managerial corruption problems in some companies. In addition, as most listed companies in 1990s were transformed from traditional SOEs, the state was still the dominant shareholder in a large number of Chinese listed companies. However, non-state institutional investors and individual investors were lacking in the power in governance and the legal systems were too weak to protect them, so they engaged in speculative behaviour instead of investment behaviour (Kang et al, 2008). Therefore, the Chinese government issued the "*Securities Law*" in 1998 to strengthen the legal support of corporate governance, and to protect the minority shareholders.

The CSRC became more active in monitoring and regulating corporate governance of public companies after introducing the "*Securities Law*" in 1998 (Kang et al., 2008). For example, the CSRC issued "*Guiding Opinions on the Establishment of the System of Independent Directors in Listed Companies*" in August 2001. In November 2001, China joined the World Trade Organisation (WTO). Joining WTO motivated China to accept the "*OECD Principles of Corporate Governance*" and to further improve corporate governance of Chinese listed companies (OECD, 2011). Therefore, based on the "*OECD Principles of Corporate Governance*", the CSRC and the National Economic and Trade Commission (NETC) jointly issued the "*Code of Corporate Governance for Listed Companies*" (hereinafter, "*Code of Corporate Governance*") in January 2002. As the first standard code in corporate governance, the "*Code of Corporate Governance*" was introduced to complement the "*Company Law*". In particular, this code concerned the protection of shareholders and paid attention to the expropriation of minority shareholders by controlling shareholders (Kang et al., 2008).

This privatisation process gives managers an opportunity to own shares in their listed companies. Therefore, managers have a much stronger incentive to enhance company performance because it is tied to their own wealth (Kang et al, 2008).

2.2.5 Phase V: From 2004 to Present

Previous obstacles to good corporate governance have been gradually mitigated in China since 2004 (OECD, 2011). In 2004, the State Council officially proposed the split-share reform, and then, this reform was formally launched by the CSRC in 2005.

The split-share reform was aimed at converting non-tradable shares into tradable shares, and hence, improving the stock market liquidity. It also addressed the concerns of price volatility and the price pressures resulting from the massive future supply of shares (Yeh, Shu, Lee, & Su, 2009). In order to govern the procedures of the split share structure reform in the individual firms, the government introduced two official documents in 2005*:* "*Guidance Notes on the Split Share Structure Reform of Listed Companies*", and "*Administrative Measures on the Split Share Structure Reform of Listed Companies*".

Prior to the split-share reform, the ownership structure in Chinese listed companies was a split-share structure with a large portion of non-tradable shares and a small part of tradable shares. Non-tradable shares were normally held by the state and the legal-person (namely, the domestic institution) investors which were partially owned by the central or local government, while tradable shares were typically held by domestic and foreign individual investors as well as domestic institutional investors (Li, Wang, Cheung, & Jiang, 2011). Although both the non-tradable and tradable shares had the same cash flow and voting rights (Firth, Lin, & Zou, 2010), this disproportional split share structure had been a big problem since the Chinese stock market was established. Yeh et al. (2009) argued that there were two problems resulting from the lack of market trading: a difficulty in measuring firm values and manager performance, and an obstruction of adopting incentive-based compensation contracts to align the managers' interests with shareholders. Firth, Lin, et al. (2010) also pointed out that the split share structure could result in divergent interests and incentive conflicts between tradable and non-tradable shareholders. According to Yeh et al, (2009), by the end of 2006, more than 80 per cent of the listed firms in China had successfully participated in the reform program. The success of the split-share reforms played a positive and important role in the development of Chinese economy and corporate governance as it ensured all the shareholders had equal rights to trade shares. In addition, it enabled all categories of shares to be priced by the market mechanism (Firth, Lin, et al., 2010). Moreover, Gao et al. (2008) found that ownership concentration was significantly mitigated after the shareholding reform, and the reduction of ownership concentration positively affected performance of Chinese listed companies. As shareholder values started to be more closely tied to company share price after the split-share reform, shareholders preferred to use firm performance to assess executive performance. Therefore, the role of

company value in determining executive compensation became more significant after split-share reform.

As Chinese lawmakers worked to imitate corporate governance of developed countries (Kang et al., 2008), both the "*Company Law*" and the "*Securities Law*" were revised in 2006. The amended "*Company Law*" 'improved companies' governance structure and mechanisms to protect lawful shareholders' rights and public interests' (OECD, 2011, p.17), and the revised "*Securities Law*" 'improved the system of governing the issuance, trading, registration and settlement of securities and provided for the establishment of multi-tiered capital-market architecture' (OECD, 2011, p.17).

After successfully completing the split-share reform and revising the "*Company Law*" and the "*Securities Law*", the CSRC introduced the "*Notice on the Matters concerning Carrying out a Special Campaign to Strengthen the Corporate Governance of Listed Companies*" (hereinafter, "*Corporate Governance Special Campaign*") in March, 2007. The CSRC divided this special campaign into three stages: the self-check stage, the public comment stage, and the rectification and improvement stage, and required all the Chinese listed firms to complete all work in three stages before the end of October in 2007 (China Securities Regulatory Commission [CSRC], 2007). Specifically, all Chinese listed companies shall allocate their own corporate governance problems through self-check, gather the investors and general public's comments and the CSRC and stock exchanges' appraisals, and take actions to improve their corporate governance. This special campaign effectively improved the corporate governance quality of individual firms. In particular, the role of board independence and diversity had started to become more important, the specialised committees of the board of directors had been strengthened, the information disclosure became more in-depth and extensive, and investors and management teams started to pay more attention to corporate social responsibility (OECD, 2011).

2.3 Current Corporate Governance System in China

2.3.1 Overview

The systems of corporate governance in western countries are normally represented by two models, namely the Anglo-American Model and the German Model. The former is characterised by a unitary board, and the latter has a two-tier board. The unitary board structure, which is prevalent in companies in the U.S. and the U.K., includes internal

directors and external directors sitting on a single board. The internal directors on the unitary board are full-time executives who are responsible for the day-to-day operations of the companies. Although the external directors do not have responsibility for day-to-day operations in this company, but may be employed in other organisations. In contrast, the German two-tier board consists of an executive board and a separate supervisory board. The supervisory board has the monitoring power and includes representatives of shareholders and employees but is normally dominated by representatives of the large shareholders (Goergen, Manjon, & Renneboog, 2008). Chinese listed firms have a unique corporate governance framework which is different from both the Anglo-American Model and the German Model.

Figure 2.3 below represents the special corporate governance framework in China. As shown in Figure 2.3, the general meeting of shareholders, the board of directors, the supervisory board, and the senior management team are four functional organs which constitute a corporation's structure. The general meeting of shareholders is empowered to be the ultimate decision making organ in a corporation by the "*Company Law*" (Kang et al., 2008). The board of directors de facto has the decision making power under the authority of general meeting of shareholders (OECD, 2011). It includes the executive directors, non-executive directors and independent (external) directors, and could establish specialised committees. According to the "*Code of Corporate Governance*", the board of directors "may establish a corporate strategy committee, an audit committee, a nomination committee, a remuneration and appraisal committee and other special committees in accordance with the resolutions of the shareholders' meetings" (CSRC, 2002, p.7). The management team consists of full-time executives appointed by the board of directors, and they take part in the day-to-day operations of the company. As the supervision organ of a corporation, the supervisory board supervises whether directors and executives violate laws or articles of association of the company and inspects company's finance (OECD, 2011), and it is made up of shareholder representatives and employee representatives. Both directors and supervisors are appointed or dismissed (Schipani & Liu, 2002) by - and are required to report to - shareholders (Dahya, Karbhari, & Xiao, 2002), while the executives are appointed or dismissed by the board of directors (Standing Committee of the National People's Congress [NPCSC], 2006). However, the directors and senior executives shall not sit concurrently on the supervisory board, according to the "*Company Law*".

Figure 2.3: Corporate Governance Structure in China

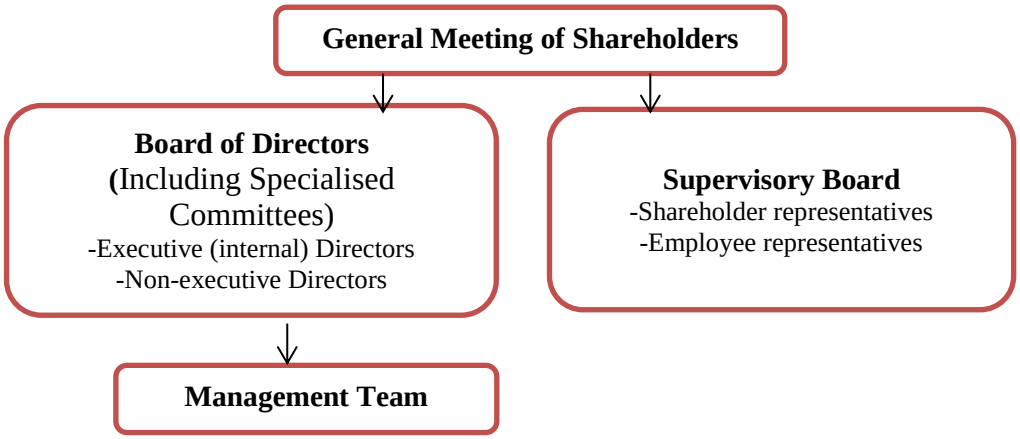


Table 2.1 below summarises the characteristics of the board of directors and the supervisory board in Chinese listed firms. It is worth noting that the supervisory board in China is different from the supervisory board in the German model because it does not have the power to appoint and dismiss executives (Xiao, Dahya, & Lin, 2004). Instead, the appointing and dismissing power belongs to the board of directors. In addition, the size of the supervisory board in China is much smaller than that in the German model. The "*Company Law*" states that the supervisory board shall be composed of not less than three members (CSRC, 2006), but the supervisory board in German model normally has up to twenty members (Cromme, 2005). Previous literature suggests that the efficiency of the supervisory board in Chinese listed firms is questionable. Xiao et al. (2004) find that in the majority of companies in their sample, supervisors serve as honoured guests, friendly advisors or censored watchdogs[6]. Clarke (2006) also supports the fact that the supervisory board does not seem to play an important role in corporate governance in China due to its ineffectiveness, and a number of companies only keeping the supervisory board with just the legal minimum number of members.

[6] According to Xiao et al. (2004), the roles of the supervisory board could be divided into four categories: it is considered to be a 'honoured guest' if it performs a nominal or honorary role; it is a 'friendly advisor' if it provides consultancy and advice to the board of directors, but it does not confront directors and senior managers even when there are problems; it is viewed as a censored watchdog if it performs its monitoring duties but the monitoring is censored or internalised; and finally, it is named an 'independent dog' if it performs its monitoring duties 'largely' independently of any interference and/or sanctions from the board of directors, the CEO and large shareholders.

Table 2.1
Comparison of the Board of Directors and the Supervisory Board

Characteristic	Board of Directors	Supervisory Board
Accountable to the shareholders' meeting	Yes	Yes
Size	5 to 19	No less than 3
Employee representative	May have employee representative	No less than one third
Meeting frequency	At least two meetings per year	At least one meeting every six months
Is an executive allowed be a member	Yes	No
Appoint or dismiss managers	Yes	No

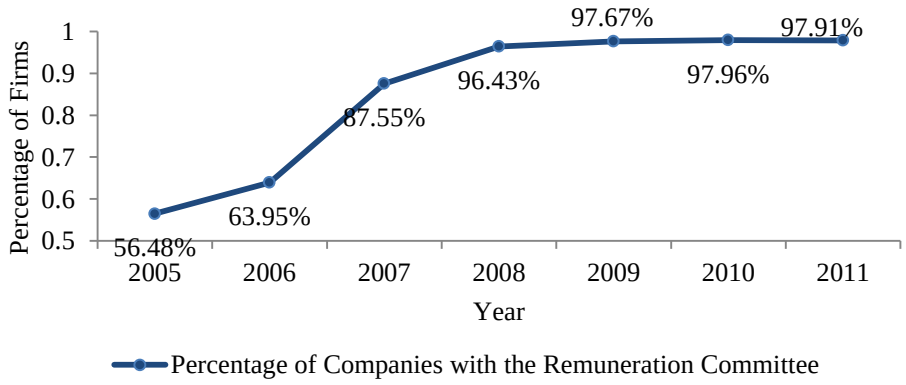
Source: Information Collected from the "*Company Law*" and the "*Code of Corporate Governance*"

2.3.2 Remuneration Committee

According to the "*Code of Corporate Governance*" (CSRC, 2001), the board of directors of listed companies shall establish a remuneration and appraisal committee. The remuneration and appraisal committee shall be chaired by an independent director and has the following two main duties:

1. "to study the appraisal standard for directors and management personnel, to conduct appraisal and to make recommendations" (CSRC, 2001, p.7); and
2. "to study and review the remuneration policies and schemes for directors and senior management personnel" (CSRC, 2001, p.7).

Figure 2.4:
Percentage of Companies with the Remuneration Committee,
2005-2011



However, Conyon and He (2012) argue that before 2002, no companies established remuneration committee. Figure 2.4 describes the growth of firms with a remuneration committee during the period 2005-2011. As shown in Figure 2.4, the percentage of

companies with the remuneration committee dramatically increased from 56.48 percent in 2005 to 97.91 percent in 2011. In particular, the most significant growth happened from 2006 to 2008. Specifically, the number of companies which had established the remuneration committee increased from 63.95 percent in 2006 to 87.55 percent in 2007, an increase of 13.60 percent. The number increased by 12.88 percent in 2008. The significant increases during the period 2006-2008 might benefit from the "*Corporate Governance Special Campaign*", launched in March, 2007.

2.3.3 Independent Directors

According to the article 123 of the "*Company Law*" (2006), "A listed company shall have independent directors. The specific method of appointing such independent directors shall be formulated by the State Council." However, the "*Company Law*" does not provide detailed information regarding the requirements and duties of the independent directors. Instead, the "*Guiding Opinion on the Establishment of the System of Independent Directors in Listed Companies*" (hereinafter, "*Guidance on Independent Directors*") introduced by the CSRC in 2001, is viewed as the most comprehensive guidance on regulating internal corporate governance through establishing the independent directors (Clarke, 2006). According to the "*Guidance on Independent Directors*" (2001), listed firms should have at least two independent directors who make up at least one third of the board of directors. Independent directors are required to have a minimum of five years' experience in law, business or other relevant fields, and at least one independent director needs to be an accounting professional. The "*Guidance on Independent Directors*" also empowers independent directors to veto related party transactions in Chinese listed firms, to recommend engagement or dismissal of the company's accounting firm, to recommend the holding of interim shareholders' meetings and the holding of board meetings, to hire outside auditors and consultants at the company's expense; and to solicit proxies prior to a shareholders' meeting (Clarke, 2006).

China has been following the example of developed countries to adopt corporate governance models. In particular, the current corporate governance model in China seems to combine the Anglo-American one-tier board with the German two-tier board. However, China should develop its institutional environment that leads to effective corporate governance rather than copying a fixed set of governance models from developed countries (Chen, 2005).

2.4 Executive Compensation in Chinese Listed Firms

As mentioned earlier, compensation has become one of the main incentives for executives in Chinese listed companies. This section provides a clear understanding of the executive compensation portfolio and identifies the problems associated with executive pay in China.

2.4.1 The Composition of Executive Compensation Package

At present, an executive compensation package in Chinese listed companies typically includes basic salary, performance-based bonus and allowance. Since 2006, a small number of companies have started to offer equity-based compensation for their executives. Cash compensation is the most important component of total compensation for top executives in Chinese listed companies, and it corresponds to a typical cash compensation package in Western companies (Kato & Long, 2006). Table 2.2 summarises compensation components for executives in Chinese listed companies. Both the basic salary and allowance have low flexibility and provide living security for executives, while bonus floats with company performance (accounting and/or stock-based performance) and provides incentives for executives. Specifically, the higher the company performance in a fiscal year, the greater the annual bonuses for executives will be in the same period. Finally, a small number of executive received equity-based compensation in the form of stock options, restricted stocks or stock appreciation rights in Chinese listed firms (Conyon & He, 2012).

Table 2.2
Components of Executive Compensation in Chinese Listed Companies

Compensation Component	Variability	Features
Basic Salary (Cash)	Small	Fixed, Stability, Security
Performance-based Bonus (Cash)	Big	Performance-related, Floated, Incentive
Allowance (Cash)	Small	Satisfaction, Security
Equity-based Compensation	Big	Performance-related, Floated, Incentive

2.4.2 Problems of Executive Compensation in China

In general, executive compensation in China has the following three problems:

1. China has a relatively weaker compensation disclosure system.

2. There are a small number of executives who get paid from resources other than the companies in which they are currently holding positions.
3. Equity-based compensation is emerging but still far from prevalent within Chinese listed companies.

2.4.2.1 Transparency

The disclosure of executive compensation is more developed and transparent in western countries. For instance, the U.S. Securities and Exchange Commission (SEC) has issued regulations regarding the compensation disclosure since the 1930s. In 1938, the SEC required registered companies to disclose information on their executives' compensation to the public (Lo, 2003). The rules have been revised and improved several times (e.g. in 1992, in 2006) by the SEC, in order to improve the transparency of executive compensation for investors and the public. The latest amendment in the SEC disclosure requirements was made in August 2006 (Faulkender & Yang, 2012). According to the SEC (2014), "In the annual proxy statement, a company must disclose information concerning the amount and type of compensation paid to its chief executive officer, chief financial officer and the three other most highly compensated executive officers". In contrast to the U.S., disclosure requirement of executive compensation has a relatively shorter history and is less developed in China. Chinese listed companies have been required to disclose the compensation of the highest paid executive since 1998 (Firth et al., 2007). Since 2001 the CSRC has required all listed companies to disclose the aggregated sum of total compensation of the top three highest-paid executives in their annual reports (Conyon & He, 2012). Only after 2005, Chinese listed companies are required to report the level of compensation for individual executives.

Although the CSRC issued the "*Regulations on Listed Companies' Information Disclosure*" in 2007 to further improve the disclosure system, executive compensation disclosure is still lacking transparency. First of all, Chinese listed companies are not required to disclose the component of executive compensation. In addition, the disclosure of equity-based compensation is not complete. Specifically, companies only need to disclose the type of equity-based compensation and its implementation in the fiscal year. The lack of information constrains the study of executive compensation in China. For instance, one cannot estimate the pay-performance sensitivity based on equity-based compensation as there is not enough disclosed information to calculate the value of equity-based compensation. As compensation disclosure could increase the

transparency of the compensation process at companies, force the board of directors to monitor executives more effectively, and prevent executives from self-seeking through setting their own pay (Faulkender & Yang, 2012), the compensation disclosure needs to be further strengthened in China.

2.4.2.2 Phenomenon of 'Zero-paid' Executives

In a small number of Chinese listed firms, there are some executives who are 'zero-paid'. After manually checking annual reports of those listed companies, it is found that those executives do not really receive 'zero pay'. Instead, they are paid by another organisation. According to the information disclosed in the annual report, there are three main pay sources for those 'zero-paid' executives: controlling shareholders, controlling shareholders' other subsidiaries, and the current listed companies' subsidiaries. Based on these three pay sources, table 2.3 below summarises companies with 'zero-paid' executives.

Table 2.3
Number of Companies with 'Zero-paid' Executives, 2006-2011

Pay Sources	Number of Listed Firms
Controlling Shareholder	23
Other Subsidiary of Controlling Shareholder	8
Listed Firm's Subsidiary	21
Total	52

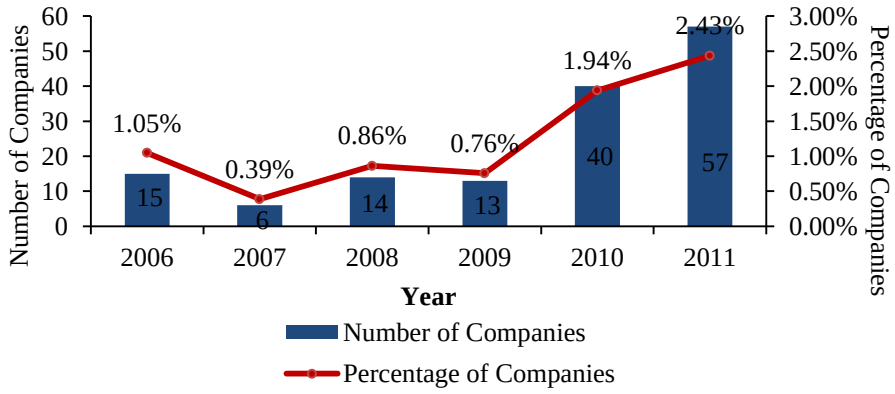
The phenomenon of 'zero-paid' executives is questionable. In particular, those executives may not be provided effective financial incentive to improve the performance of listed companies. In this study, those 'zero-paid' executives are deleted from the final sample as their compensation is not determined by the listed company they are currently holding positions.

2.4.2.3 Insufficient Equity-based Compensation

The dramatically improved regulations, financial market conditions and the legal environment have made it possible for Chinese listed firms to adopt equity incentive plans (Lian, Su, & Gu, 2011). At the end of 2005, equity-based compensation was introduced by the CSRC through releasing the "*Regulations on Equity Incentives of Listed Companies (Trial)*" (hereafter, "*Regulations*"). According to this "*Regulations*", Chinese listed companies which have completed split-share reform are allowed to

implement equity incentives from 2006 (CSRC, 2005). Although there has been an appetite for granting equity-based compensation in China, it is still not as prevalent as in developed countries (e.g. the U.S. or the U.K.). Figure 2.5 presents the annual number of companies starting to use equity-based compensation during the period 2006-2011. As shown in Figure 2.5, there were a limited number of companies starting to adopt the equity-based compensation before 2010, while there were no more than 15 companies per year. The figure dramatically increased to 40 in 2010, and rose to 57 in 2011. By the end of year 2011, the number of companies which have adopted equity-based compensation has increased to 145. However, those companies only take up 2.43 percent of all Chinese listed companies, still a very small proportion.

Figure 2.5:
Companies Starting to Adopt Equity-based Compensation, 2006-2011



Data Source: CSMAR Database Developed by the GTA Company

2.5 Conclusion

Chapter 2 offers a proper understanding of the institutional background for this study. China has gradually transited from a centrally 'planned economy' to a market economy through the economic reform since 1978, and the corporate governance in China has been growing up with establishing a modern enterprise system. Section 2.2 in this chapter divides the history of Chinese economic reform into five phases. The first phase is pre-1978. In this phase, China was characterised with centrally 'planned economy', and there were a lack of financial incentives for executives in SOEs. 1978-1983 is the second phase. The major feature of this phase was decentralisation. The government gradually phased out its central planning function via releasing more autonomy to individual SOEs and their executives. During this period, the profit-sharing schemes provided the basic economic incentive for SOEs executives. The third phase is 1984-

1992. The SOEs reform in this phase aimed at separating SOEs management and state ownership, and the managerial incentive system was improved through aligning executives' annual compensation with company performance. 1993-2003 is the fourth phase. This phase was characterised with SOEs privatisation and the establishment of a modern enterprise system. The introducing of the "*Company Law*" and the "*Code of Corporate Governance*" empowered the board of directors and its remuneration committee to decide on compensation packages for executives at individual companies. The final phase is from 2004 to present. During this phase, China successfully completed the split-share reform, and a few Chinese listed companies had started to adopt equity-based compensation for their executives.

Section 2.3 explores the current corporate governance model in China. The board structure in Chinese listed companies differs from the one-tier board in Anglo-American model, and it is also distinct from the two-tier board in the German model. Specifically, Chinese listed companies have a board of directors including executive directors, non-executive directors and independent directors, and a separated supervisory board. Both the board of directors and the supervisory board are appointed or dismissed by shareholders, while the executives are appointed or dismissed by the board of directors. The "*Code of Corporate Governance*" encourages the board of directors at individual companies to establish the remuneration committee chaired by an independent director to set and assess executive compensation.

Section 2.4 reviews components and current problems of executive compensation in China. Cash compensation is the most important component in the compensation package for top executives in Chinese listed companies, and it normally includes basic salary, performance-based bonus and allowance. A small number of companies have started to adopt equity-based compensation since 2006. Although the role of compensation in providing financial incentives for executives has become more significant, it still has problems. First of all, the disclosure of executive compensation is less developed and transparent when compared with western countries. Secondly, the existence of 'zero-paid' executives creates obstacles to providing effective financial incentives for those executives. Finally, the equity-based compensation is far from prevalent in China.

The next chapter will provide a comprehensive literature review in the fields of executive compensation. In particular, it will explore the determinants of executive

compensation from three important theories: the principal-agent theory, the tournament theory, and the managerial power theory. By reviewing prior literature, the next Chapter will identify the research gaps and lead to the theoretical foundation for this study.

Chapter 3: Literature Review

"If I have seen further, it is by standing on the shoulders of giants."

-Isaac Newton, 1675[7]

3.1 Introduction

The previous chapter described the institutional context of this study. This chapter documents the research background and research gaps through reviewing prior theoretical models and empirical literature in the fields of executive compensation. It begins with a review of three important theories in executive compensation literature, namely the principal-agent theory, the tournament theory and the managerial power theory. It goes on to empirical studies on the relation between compensation level and company performance, the influence of hierarchical levels on executive compensation plans, the role of the remuneration committee in determining compensation plans, and the effectiveness of adopting equity-based compensation in improving company performance.

The rest of this chapter is organised as follows:

- Section 3.2 reviews the classical principal-agent theory, the tournament theory, and the managerial power theory.
- Section 3.3 contrasts empirical studies on pay-performance relation in the context of China to those in developed countries.
- Section 3.4 reviews empirical literature regarding executive compensation and hierarchical level in the context of both developed countries and China.
- Section 3.5 discusses empirical evidence on the influence of the remuneration committee on executive compensation.
- Empirical literature regarding the effectiveness of equity-based compensation in improving firm performance is reviewed in section 3.6.
- Section 3.7 is the conclusion section, and it identifies research gaps and how this study contributes to the existing literature.

[7] Isaac Newton is an English physicist, mathematician, astronomer, alchemist, inventor and natural philosopher. The quote is from a letter written to fellow scientist, Robert Hooke in February 1675. Available at http://www.bbc.co.uk/worldservice/learningenglish/movingwords/shortlist/newton.shtml

3.2 Review of Theories

Known as the predominant theory in executive compensation literature, the principal-agent theory suggests that performance-based compensation provides financial incentives for executives because it aligns executives' interests with those of shareholders, and thus, alleviates the interest-conflicts. As a reduced form of an agency model, the tournament theory supplements the classical principal-agent theory by looking at the role of position hierarchy in explaining executive compensation. However, the managerial power theory holds an opposite view that executive compensation might be part of the agency problem itself as executives might extract rent through their power to influence compensation plans. Although the managerial power approach takes a very different view from the classical principal-agent theory, Bebchuk, Fried, and Walker (2002) argue that the former is not viewed as a complete replacement for the latter, and compensation practices could be explained both by the managerial power and by the classical principal-agent approach.

The classical principal-agent approach suggests that compensation packages are optimally designed to provide incentives for executives to maximize shareholder value. However, in practice, there is no optimal contract that would perfectly align the interests of managers and shareholders (Bebchuk et al., 2002). Therefore,, the classical principal-agent theory, tournament theory and managerial power theory are viewed as complementary theories to form the theoretical foundation for this study.

3.2.1 Principal-agent Theory

The principal-agent theory plays a foundational and important role in executive compensation literature. This theory focuses on the principal-agent problem resulting from the separation of ownership and control. The principal-agent relationship is defined as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent" by Jensen and Meckling (1976, p. 308). However, the existence of interest-divergences between the principal and agent (Jensen & Meckling, 1976) and the moral hazard problem due to the imperfect information in a principal-agent relationship (Holmström, 1979) may lead to the fact that the agent will not always act in the best interests of the principal (Jensen & Meckling, 1976). Therefore, the principal could mitigate the agency problem through providing appropriate incentives for the agent and by establishing monitoring

mechanisms to limit the aberrant behaviours of the agent (Jensen & Meckling, 1976). Consequently, according to the principal-agent theory, the compensation plans need to be designed to align the interests of executives with those of shareholders in order to alleviate the interest-conflicts between shareholders (principals) and executives (agents) in modern companies.

According to Murphy (1999), "the fundamental insight emerging from the traditional principal-agent models is that the optimal contract mimics a statistical inference problem: the pay-outs depend on the likelihood that the desired actions were in fact taken" (p.2519). The optimal pay-for-performance term based on the traditional principal-agent model has been addressed by a number of studies (e.g. Holmström & Milgrom, 1987; Rosen, 1990; Garen, 1994; Murphy, 1999; Conyon & Sadler, 2001). Suppose that $\chi = e + \varepsilon$ represents the firm value, where e represents the effort of executive, and the random variable ε captures normally distributed uncontrollable noise, $\varepsilon \approx N(0, \sigma^2)$. Also, suppose that the contract of executive pay scheme $p(\chi)$ is a linear function, $p(\chi) = s + b\chi$, where s is the fixed salary, and b is the pay-for-performance term (i.e. optimal sharing rate, according to Murphy (1999)). As the principal-agent theory assumes that the agent is risk adverse, the exponential utility function is given by $U(\chi) = \exp[\rho(Wc(e))]$, where ρ is the absolute risk aversion of the agent and $c(e)$ is the convex disutility of effort, then the pay-for-performance term can be given by:

$$b = \frac{1}{1 + \rho c''(e)\sigma^2} \tag{3.1}$$

As can be seen from the model, pay for performance sensitivity negatively depends on the agent risk aversion ρ, the cost-of-effort of agent $c(e)$, and the corporate performance variability σ^2. Specifically, the optimal pay-performance sensitivity (PPS) increases as the uncertainty of firm value and/or the agent's risk version decreases. In particular, the optimal pay-performance sensitivity will be equal to one when there is no performance volatility ($\sigma^2 = 0$) and/or executives are risk-neutral ($\rho = 0$).

However, as the traditional principal-agency model does not provide clear guidance on exact specification or identification (Doucouliagos, Haman, & Stanley, 2012), prior literature normally relies on the reduced-form linear models to estimate the pay-performance relation. In general, there are three approaches largely applied in previous literature. One of the prevalently adopted models is the following pay level model:

$$ln(pay)_{i,t} = \alpha + \beta(performance)_{i,t} + \gamma X + \varepsilon_{i,t} \quad (3.2)$$

Where *ln* indicates the natural logarithm, pay represents either cash compensation or total compensation. Performance is measured by either accounting-based performance or stock returns, and β is the coefficient of pay-performance link. *X* represents a set of control variables which potentially influence the level of executive compensation, and γ is the corresponding coefficient; ε is the error term.

Model 3.2 could be estimated separately by executives (e.g. Janakiraman, Lambert, & Larcker, 1992; Jensen & Murphy, 2010) or for pooled executives if time trends and pay-performance relations are assumed to be constant across executives (e.g. Lambert et al., 1993; Conyon & He, 2011). In addition, as argued by Murphy (1999), researchers may have to choose whether to use compensation level directly or to take natural logarithms of pay, and whether to measure performance in value or in rates of return, when estimating how the changes of compensation respond to the changes in company performance. The choice will in turn lead to two different interpretations of the coefficients of pay-performance relation: pay-performance sensitivity (notably, Jensen & Murphy, 1990) or pay-performance elasticity (notably, Murphy, 1985; Coughlan & Schmidt, 1985). Consequently, the changes of compensation responding to the changes in company performance could be modelled in two different ways as follows:

$$\Delta(pay)_{i,t} = \alpha + \beta\Delta(performance)_{i,t} + \gamma\Delta X + \varepsilon_{i,t} \quad (3.3)$$

Where Δ is a first difference operator, so $\Delta(pay)_{i,t} = pay_{i,t} - pay_{i,t-1}$, and $\Delta(performance)_{i,t} = performance_{i,t} - performance_{i,t-1}$. However, Hall and Liebman (1998) suggest that directly using changes as the measurement might present a misleading picture of pay to performance relationships, because the change in firm performance $\Delta(performance)_{i,t}$ is so large. In particular, a several million dollar change in CEO wealth seems to be very small when divided by the annual change in the market value (Hall & Liebman, 1998). The size effect could be better statistically controlled if pay-performance elasticity is estimated. Therefore, some literature replaces

$\Delta(pay)_{i,t}$ and $\Delta(performance)_{i,t}$ by $\Delta ln(pay)_{i,t}$ and $\Delta ln(performance)_{i,t}$, respectively, in order to test the pay-performance elasticity.

$$\Delta ln(pay)_{i,t} = \alpha + \beta \Delta ln(performance)_{i,t} + \gamma \Delta X + \varepsilon_{i,t} \quad (3.4)$$

Equation 3.4 controls for the dominant effects of large value on estimates by taking the natural logarithm, comparing with Equation 3.3. However, pay-performance elasticity has no corresponding agency-theoretic interpretation (Murphy, 1999).

This study relies on Equation 3.2 to estimate the role of firm performance and other determinants in influencing executive compensation, given that the direct use of arithmetical differences might result in biased estimation due to the effects of a large value, whereas pay-performance elasticity is lacking the corresponding agency-theoretic interpretation.

3.2.2 Tournament Theory

The classic principal-agent theory, although important and dominant, has offered insufficient empirically testable insights into the compensation schemes in hierarchical organisations (Gibbs, 1995; Lambert et al., 1993; Ortín-Angel & Salas-Fumás, 1998). Therefore, researchers develop supplementary theories such as tournament theory by considering the role of hierarchical levels in explaining executive compensation. The tournament theory, as developed by Edward Lazear and Sherwin Rosen in 1981, suggests that large differences of compensation across executive hierarchical levels within the same company might have to provide adequate incentives for executives. Specifically, the tournament theory considers the internal compensation schemes among executives as sequential tournaments where executives compete against one another at a given hierarchical level in order to be promoted to a higher hierarchical level and to get higher compensation associated with the promotion (Rosen, 1986).

Below introduces a simply tournament model, following Lazear and Rosen (1981), Eriksson (1999) and Conyon and Sadler (2001). Consider a tournament with two identical vice-presidents, represented as *j* and *k*. Those two vice-presidents compete against each other for the CEO position. The winner of this tournament is promoted to the CEO position and is rewarded a fixed prize, W_1, and the tournament has another fixed prize, W_2, for the loser who will stay in the vice-president's position. The

contestant's output, denoted by q depends on each vice-president's effort level, denoted by μ, and a random or luck component, denoted by ε, $\varepsilon = (0, \sigma^2)$. Then, the output of contestant j will be:

$$q_j = \mu_j + \varepsilon_j \tag{3.4}$$

Similarly, the output of contestant k will be:

$$q_k = \mu_k + \varepsilon_k \tag{3.5}$$

Let P be the probability of winning. Vice-president j will win if he/she produces more output than rival k. Therefore, for contestant j, the probability of winning is:

$$\begin{aligned} P &= prob(q_j > q_k) = prob(\mu_j + \varepsilon_j > \mu_k + \varepsilon_k) \\ &= prob(\mu_j - \mu_k > \xi) \\ &= prob(\mu_j - \mu_k > \varepsilon_k - \varepsilon_j) \\ &= \mathrm{G}(\mu_j - \mu_k) \end{aligned} \tag{3.6}$$

Where $\xi = \varepsilon_k - \varepsilon_j$, G denotes the cumulative distribution function of ξ.

As can be seen in Equation 3.6, for vice-president j, the probability of winning positively depends on the effort level of j, negatively depends on the effort level of k, and is also affected by the distribution of the random variable, ε. Both contestants want to maximise their probability of winning. Then, for contestant j,

$$\frac{\partial P}{\partial \mu_j} = \frac{\partial G(\mu_j - \mu_k)}{\partial \mu_j} = g(\mu_j - \mu_k) \tag{3.7}$$

Let $C(\mu)$ denote the cost of effort function. According to Eriksson (1999), both the first order condition $C'(\mu)$ and the second order condition $C''(\mu)$ for effort level are assumed to be positive. The expected utility for contestant j is:

$$\begin{aligned} U(\mu_j) &= P(W_1 - C(\mu_j)) + (1-P)(W_2 - C(\mu_j)) \\ &= P(W_1 - W_2) + W_2 - C(\mu_j) \end{aligned} \tag{3.8}$$

The first order derivative is given by:

$$U'(\mu_j) = (W_1 - W_2)\frac{\partial P}{\partial \mu_j} - \frac{\partial C}{\partial \mu_j} \tag{3.9}$$

As each contestant aims to maximise his or her expected utility through their effort level, then:

$$U'(\mu_j) = (W_1 - W_2)\frac{\partial P}{\partial \mu_j} - \frac{\partial C}{\partial \mu_j} = 0 \tag{3.10}$$

Equation 3.10 can be also written as:

$$(W_1 - W_2)\frac{\partial P}{\partial \mu_j} = \frac{\partial C}{\partial \mu_j} \tag{3.11}$$

Substitute $\frac{\partial P}{\partial \mu_j}$ in Equation 3.11 with $g(\mu_j - \mu_k)$, the best reaction function of contestant *j* is:

$$(W_1 - W_2)g(\mu_j - \mu_k) = \frac{\partial C}{\partial \mu_j} \tag{3.12}$$

As mentioned before, contestant *j* and contestant *k* are assumed to be identical. In the Nash equilibrium, both of them choose the same level of effort. That is to say, $\mu_j - \mu_k = 0$. In addition, the outcome of the game is random in equilibrium. In other words, the probability of winning (P) is defined by the following equation:

$$P = G(0) = 1/2 \ . \tag{3.13}$$

Consequently, Equation 3.12 can be rewritten as:

$$C'(\mu_j) = \frac{\partial C}{\partial \mu_j} = (W_1 - W_2)g(0) \tag{3.14}$$

Equation 3.14 shows that the equilibrium level of effort depends on differentials between winning and losing prizes. Specifically, vice-president *j*'s effort investment increases as the prize spread between moving up to CEO position and staying at the vice-president position also increases.

According to Eriksson (1999) and Conyon and Sadler (2001), Equation 3.14 together with tournament theory, provides some testable predictions related to executive compensation. First of all, tournament theory predicts that compensation is an increasing function of hierarchical level within the company (Conyon & Sadler, 2001; Lambert et al., 1993). The higher pay is to compensate for the loss of promotion

opportunities at higher hierarchical levels. In addition, executives at the top should be given extra weight of rewards as there is no further promotion opportunity at the final stage of the game (Rosen, 1986). Therefore, tournament theory predicts that there should be an extraordinarily large difference in compensation level between the CEO and the managers at the next lower hierarchy, compared with pay differences across other adjacent hierarchical levels (Lambert et al., 1993; Eriksson, 1999). Consequently, the function between executive compensation and hierarchical levels can be characterised as being convex (Lambert et al., 1993; Eriksson, 1999; Conyon & Sadler, 2001; Lin et al., 2011). As this study tests the role of hierarchical levels in determining executive compensation, it focuses on those two predictions.

The tournament theory also predicts in production environments where contributions of luck or other random factors to output are more important, so that a larger compensation differential is used to substitute for the effort reducing the effect of randomness (Eriksson, 1999). Furthermore, the tournament model predicts that the size of tournament prize is an increasing function of the number of players (O'Reilly III, Main, & Crystal 1988; Main, O'Reilly III, & Wade, 1993). This is because each contestant implicitly gives up some of the expected compensation associated with his marginal product or performance, and then this becomes part of the overall tournament prize (Conyon & Sadler, 2001; Conyon, Peck, & Sadler, 2001). Finally, as shown in Equation 3.14, the wider the compensation dispersion results in the higher the level of effort. Therefore, tournament theory suggests that large compensation dispersion has a positive effect on company performance (Bloom, 1999; Eriksson, 1999; Chen et al., 2011).

3.2.3 Managerial Power Theory

Known as an important economic model in the area of corporate governance, the classical principal-agent theory has offered a clear understanding that financial incentive such as performance-based compensation is crucial to alleviate the agency problem. However, some scholars argue that the classical principal-agent theory is too constrained (Lambert et al, 1993), and gives little consideration to the role of non-economic factors such as sociological or psychological factors in explaining executive compensation. In particular, the ways in which individual agents obtain their preferences are normally negligent in agency theory-based literature (Grabke-Rundell & Gomez-Mejia, 2002). Therefore, researchers start to explain executive compensation from alternative perspectives such as the managerial power perspective.

The managerial power theory challenges the view of agency theory that executive compensation is set through arm's-length contracting between executives and boards of directors (Bebchuk & Fried, 2004). As an alternative approach to explain executive compensation, the managerial power theory views executive compensation as part of the agency problem itself because an executive might extract additional rent using managerial power (Bebchuk & Fried, 2003). For instance, executives are able to take advantage of their power to influence both the level and structure of compensation (Murphy, 2002). To be specific, an executive might use his/her power to get the favourable higher compensation level but lower pay-performance link. Therefore, the power is normally defined as the ability of executives to influence pay decisions made by the board of directors or the remuneration committee (Finkelstein, 1992; Lambert et al. 1993). In particular, the managerial power model emphasises the power facilitated by the inefficient remuneration committee (Conyon, 2006).

In fact, researchers related to the agency theory have alluded to managerial power as being a key variable in determining executive compensation, although they have not directly operationalised and tested the influence of managerial power on compensation (Grabke-Rundell & Gomez-Mejia, 2002). For instance, it has been argued that a CEO will have less influence over compensation plans if the roles of the CEO and chairman of the board of directors are separated (Boyd, 1994; Conyon, 1997). In addition, as argued by Williamson (1985), firms with less independent remuneration committee provide opportunities for managers to write their own contracts with one hand and sign them with the other.

It is worth noting that there are many different sources of managerial power, and they can be related to social influence. The theory of social influence argues that in the interpersonal contexts, the beliefs, attitudes, or behaviour of one person will be intentionally or unintentionally influenced by another person (Simpson, Farrell, Oriña, & Rothman, 2015). This theory of social influence can date back to 1959 when psychologist French and Raven discussed the relationship of social influence and power. According to French and Raven (1959), power is the potential ability of one person to influence another person, and there are five important bases of power: reward power, coercive power, legitimate power, referent power, and expert power. Each power base is believed to be associated with the use of different influence strategies and tactics, each of which in turn has unique effects on the targets of influence (Simpson et al., 2015).

Organisations consist of individuals working both independently and interdependently on sets of coordinated tasks (Ferris et al., 2002). Executives in business organisations could influence the beliefs, attitudes, or behaviours of others, and the strength of their influence depends on the magnitude and source of their power. Specifically, executives can gain their power from a number of different sources, such as managerial job tenure (Ryan & Wiggins, 2004; Ryan, Wang, & Wiggins, 2009), executive ownership (Finkelstein, 1992), executive political power (Chen et al., 2011). Taking job tenure as an example, prior literature has shown that executives with longer job tenure will have greater social influence and are more likely to be able to influence the board of directors (Wade, O'Reilly, & Chandratat, 1990; Fiss, 2006).

Although this study does not attempt to use tenure as a proxy of managerial power, I do believe that job tenure potentially determines managerial power. Therefore, as will be discussed in Chapter 4, job tenure is viewed as a control variable in regressions.

3.3 Executive Compensation and Company Performance: Empirical Studies

A central theme in the field of executive compensation is whether the level of compensation is positively related to company performance. This section reviews empirical studies on the relation of compensation level and company performance in developed countries, and then moves on to empirical literature in China.

3.3.1 Empirical Studies in Developed Countries

A majority of studies on the relationship of executive compensation and company performance has been focusing on developed countries such as the U.S. and the U.K. These studies benefit from the advanced compensation disclosure system in the Anglo-American capitalism. Early studies normally focus on company's objective function, and predict that managers would maximise profit if they make an effort to improve shareholders' interests, but if the managers are self-interested, then they would enter the sales and assets amount into the firm's objectives (Rosen, 1990). These studies test and compare the pay-sales relation and the pay-profits link based on Baumol (1959)'s statement: "Executive salaries appear to be far more closely correlated with the scale of operations of the firm than with its profitability" (p. 46). This is supported by McGuire, Chiu, and Elbing (1962) and Ciscel (1974) who find that the relation of executive compensation and sales is stronger than the compensation-profits relation. Lewellen and Huntsman (1970) expand the McGuire et al. (1962) study using a multivariate

regression model, in order to reduce various statistical and measurement biases. However, they find an opposite result that profits have a strong and persistent influence on executive compensation, whereas sales seem to have less effect. However, after further correcting the collinearity and heteroscedasticity of Lewellen and Huntsman's 1970 study, Smyth, Boyes, and Peseau (1975) and Ciscel and Carroll (1980) suggest that both sales and profits are influential factors which determine executive compensation. In addition to the above studies using data in the U.S., there are two representative empirical studies in the U.K., namely Cosh (1975) and Meeks and Wittington (1975). Both of these studies use a sample of British companies during the period 1969-1971. However, the former utilises a pooled data, and the latter employs data separated by year. Cosh (1975) finds that company size (measured by the natural logarithm of total assets) is the major determinant of chief executive compensation, but profitability plays a minor role, while Meeks and Wittington (1975) suggest that both the profitability and firm growth significantly affect executive compensation. Consequently, early studies have not reached a consensus that executive compensation is more closely tied to sales or profit.

Successors also argue that there are some limitations in these early studies. First of all, previous cross-sectional estimates of compensation and performance relationship suffer a serious omitted variables problem (Murphy, 1985). Ignoring unobserved individual or firm specific effects will generate biased and misleading results. In addition, early studies relying on accounting-based profitability may suffer measure errors and biased empirical results as the accounting-based profitability might be at the discretion of firm's management (Coughlan & Schmidt, 1985). Although accounting-based profitability may provide valuable information for assessing an executive's unobservable actions, in the U.S. where equity-based compensation is relatively more prevalent, the changes in executive wealth might be exclusively determined by market-based firm performance (Jensen & Murphy, 1990). Therefore, stock market-based performance measure also needs to be involved in studies on pay-performance link.

Executive compensation literature has stepped into a new stage since Michael C. Jensen and William H. Meckling put forward the principal-agent theory in 1976. A large number of studies have been rooted in this classical theory. According to the principal-agent theory, executive compensation plans should be designed to align managers' interests with those of shareholder (Jensen & Meckling, 1976). What estimated pay-performance sensitivity has been reported in the literature?

Using a sample of individual executives during the period 1964-1981, Murphy (1985) re-examines the firm's performance and managerial pay relation in the U.S. Comparing it with earlier studies, Murphy's 1985 study has the following features. First of all, he includes equity-based compensation rather than cash compensation (salary plus bonus) alone. In addition, he uses the first difference model to avoid fixed-effects bias resulting from omitted variables. Murphy (1985) concludes that managerial compensation is strongly and positively affected by company performance measured by the rate of return realised by shareholders. In addition, compensation is positively and significantly influenced by sales growth when samples are restricted to CEOs (Murphy, 1985). This is inconsistent with Coughlan and Schmidt (1985) who indicate that there is an insignificant effect of sales growth on executive compensation. According to Coughlan and Schmidt (1985), one important reason for the different results might be that their sample includes a great proportion of executives who are first or final year CEOs, while the optimal compensation policy for a CEO's initial or final year of career will be different from that of other years (Coughlan & Schmidt, 1985). As suggested by Coughlan and Schmidt (1985), compensation for a CEO's beginning or final year will be not linked to sales growth because such a link would reward him for the efforts of his predecessor in the first year and would encourage excessive advertising or marketing expenditures in his last year.

An influential pay-performance sensitivity study has been constructed by Jensen and Murphy (1990). In their study, the pay-performance sensitivity is defined as the dollar change of CEO's wealth associated with a dollar change in the shareholders' wealth. However, Jensen and Murphy (1990) only observe a small relationship between the cash compensation of CEOs and company performance using a sample of companies in the U.S. from 1974 to 1986. To be specific, each 1,000 dollars change in shareholder wealth leads to only two cents increase of salary and bonus (Jensen & Murphy 1990). The pay-performance sensitivity is strengthened although it is still small when options, stockholdings and the performance related dismissal are added to the CEO's wealth. According to Jensen and Murphy (1990), each 1,000 dollars change in shareholder wealth results in 3.25 dollars change of the CEO's total wealth.

This weak pay-performance relation is also indicated in the U.K. Following Murphy (1985) and Jensen and Murphy (1990), Gregg, Machin and Szymanski (1993) are among the first to estimate pay-performance sensitivity in the U.K. using the first difference estimator. Using data on approximately three hundred large U.K. companies

in the 1980s and early 1990s, Gregg et al. (1993) indicate that the high growth in highest paid director's cash compensation is weakly related to corporate performance. The weak relationship even disappears during the period of recession between 1989 and 1991. During this period, top directors' high compensation is related to neither company accounting-based performance nor stock market-based performance (Gregg et al., 1993). Similarly, using a sample of 213 large U.K. companies from 1988 to 1993, Conyon (1997) observes little evidence of the relationship between the compensation of the highest paid directors and pre-dated shareholder returns. However, Conyon (1997) find a positive relation of director compensation and contemporary shareholder returns.

The relationship between compensation and performance tends to be relatively stronger, according to a number of empirical studies after the mid-1990s. For example, Murphy (1999) finds that pay-performance sensitivities have nearly doubled to 0.6% by 1996, and the increasing pay-performance sensitivities are driven primarily by stock options and stock ownership (see also Hall & Liebman, 1998). This is consistent with the finding in Jensen and Murphy (1990) that the pay-performance sensitivity is enhanced when stock options and stockholdings are added to the wealth of the CEO.

Although Lewellen and Huntsman (1970) suggest that cash compensation is, statistically, a much better measure of executive compensation than the measure that includes all of the payments, compensation structure has changed a lot since their study (Conyon & Sadler, 2001). Equity-based compensation normally takes a larger proportion than cash compensation in both the U.S. (Murphy, 1999) and the U.K. (Conyon & Murphy, 2000). Main, Bruce and Buck (1996) were among the first to construct a broader measure of compensation in the U.K. They define compensation as the sum of the cash compensation and value of option holdings, where the option value is calculated by the Black and Scholes formula. Using a sample of 60 companies in the U.K. during the period 1981-1989, Main et al. (1996) observe that the broad measure of compensation is more significantly sensitive to corporate performance, comparing with cash compensation. Similarly, using a fifteen-year (1980-1994) panel data of CEOs in large publicly traded companies in the U.S., Hall and Liebman (1998) document a strong positive relationship between company performance and CEO compensation, while this significantly positive relation is generated almost entirely (about 98%) by changes in the value of equity incentives.

Recently, it appears that there is a growing body of studies on pay and performance link outside the U.S and the U.K. Brunello, Graziano and Parigi (2001) provide the first empirical study on executive compensation in Italy. Using survey data consisting of 2,996 executive-year observations from 107 firms in Italy during 1993–1996, they find a low sensitivity of incentive compensation to company performance. The weak link between top managerial compensation and corporate performance even disappears in Gigliotti's study in 2013 in which a more recent sample of 153 Italian companies during the period 2004-2009 is employed. Differently, using a unique ten-year CEO-level panel data from 1986 to 1995, Kato and Kubo (2006) indicate that the Japanese CEO's cash compensation is positively and significantly related to accounting-based performance. More recently, in the context of a two-tier board system, Andreas, Rapp, and Wolff (2012) find a positive and significant pay-performance relation using a novel data set that covers German Prime Standard firms between 2005 and 2008.

In addition to the abnormal return, the relative performance evaluation also captures the attention of some scholars. Holmström (1979) argues that the imperfect information in a principal-agent relationship will lead to a moral hazard problem for risk sharing agents so that the probability distribution of the outcome is affected by their private actions, but the welfare of both the principal and the agent can be improved by using any additional information about the agent's action. As some shocks might be common to companies within the same industry or market, owners want to reward managers' efforts by looking at the profit outcome of the company relative to other firms in the same industry or market (Conyon & Sadler, 2001). The relative performance evaluation model predicts that an executive will receive lower compensation if executives of rival firms provide higher shareholder returns when other things are equal (Aggarwal & Samwick, 1999). However, empirical evidence regarding the relation between executive compensation and relative performance is mixed. Using a sample of 1,668 CEOs from 1,049 U.S. companies during the period 1974-1986, Gibbons and Murphy (1990) find that CEO pay changes are positively related to the company's stock return, but negatively to both industry value-weighted and market value-weighted relative performance. This is inconsistent with Jensen and Murphy (1990), who observe that pay changes are unrelated to market-based performance. Using data on 796 Japanese companies from 1968 to 1992, Joh (1999) suggests that executive compensation goes up when industry-based relative performance increases. In particular, this positive relation

is stronger in a competitive industry than a concentrated industry, and is closer in a slow-growing industry than a fast-growing industry (Joh, 1999).

Although Jensen and Murphy (1990) argue that pay for performance sensitivity should be different for different individuals or firms (see also Conyon & Sadler, 2001), most of the studies reviewed above estimate the average pay for performance sensitivity using a reduced form linear model. Alternatively, Jensen and Murphy (2000) estimate the individual pay-performance sensitivity for each CEO in a sample of 2,505 CEOs from 1,400 companies from 1975 through to 1988, in order to conduct an in-depth statistical analysis of executive incentives. In contrast to prior studies, Jensen and Murphy (2000) focus on how each CEO is paid rather than how much they are paid. The empirical findings in Jensen and Murphy (2000) indicate that pay for performance is getting worse rather than better. In particular, there is a big difference between the CEO with the best incentive and the CEO with the worst incentive. For instance, the CEO ranks first has a 231.53 dollars increase in wealth for every 1,000 dollars increase in shareholder wealth, while for CEOs from companies with worst incentives, a 1,000 dollars change in shareholder wealth leads to less than 1 dollar change in individual CEO wealth (Jensen & Murphy, 2000). Jensen and Murphy (2000) also argue that for most CEOs, the link between CEO wealth and shareholder wealth is contributed to by the stockholdings of CEO.

Following Jensen and Murphy (2000), Garen (1994) employs the estimation of pay-performance sensitivity for each CEO, in order to test the determinants of individual pay-performance sensitivities. Consistent with the implication of the principal-agent theory, Garen (1994) observes that the compensation plan involves a trade-off between incentives and insurance. Based on data for CEOs from 430 companies, he finds that company size has a negative impact on pay-performance sensitivity. Garen (1994) also finds a positive effect of CEO age on pay-performance sensitivity, consistent with Gibbons and Murphy (1992) who argue that more incentive pay is required when the CEO is closer to the retirement.

Conyon and Murphy (2000) compare the pay for performance sensitivity in the U.S. to that in the U.K. Statistics based on individual pay for performance sensitivity of each CEO show that both the mean and median pay-performance sensitivities for CEOs in the U.S. are significantly higher than those in the U.K. Following Conyon and Murphy (2000), Conyon and Sadler (2001) compute the individual pay-performance sensitivity

for executives (including other top executives more than just CEOs) from the U.K. companies, in order to explore how pay-performance sensitivity varies with executive hierarchical levels within the company. They find that executives at the higher hierarchical level have greater pay-performance sensitivity, when compared with those at lower level hierarchy.

3.3.2 Empirical Studies in China

Studies on the relation of executive compensation and company performance in the context of China are emerging and relatively insufficient, comparing with the extensive literature in developed countries, primarily due to the data availability. Studies on the relation of executive compensation and company performance in the context of China normally follow models which have been widely applied in prior literature in the U.S. and the U.K. (e.g. Jensen & Murphy 1990; Murphy 1985; Murphy 1999). Overall, a positive pay-performance relation has been observed in most of Chinese literature, and the positive relation is moderated by other factors such as ownership structure.

Early studies typically rely on survey data of SOEs during the period when the stock exchanges and publicly listed firms have not appeared in China. Many of the early studies aim to test the success of the managerial reform during the SOEs reform process, and most of empirical evidence shows a positive link between executive compensation and firm performance in Chinese SOEs. Using data drawn from a questionnaire survey carried out in collaboration with the Economics Research Institute of the Chinese Academy of Social Sciences (CASS), Grove et al. (1995) examine the relationship between executive compensation and enterprise performance before and after the managerial reform. Using a sample of 769 Chinese SOEs during the period 1980-1989, they find that profit becomes an important factor in shaping managerial wages after the managerial reform. A similar result is found in a more comprehensive study by Mengistae and Xu (2004) who rely on the same data source and adopt the standard fixed-effect panel data model. However, Mengistae and Xu (2004) narrow their observations to CEOs only. Empirical evidences of the positive relationship between executive compensation and enterprise performance above support the success of managerial reform in Chinese SOEs. However, Choe and Yin (2000) question the efficiency of an incentive compensation system in maximising profit. Specifically, Choe and Yin (2000) theoretically suggest that if the government aims to provide incentives for SOEs to maximise profit, the targeted profit in the managerial contracts should be

reasonably low and the penalty has to be severe. In reality, however, profit targets are ambiguous in much of the managerial contracts in SOEs, and, under this uncertainty, those contracts fail to provide incentives for executives (Choe & Yin, 2000).

As mentioned in the previous chapter, a large number of Chinese SOEs went into the process of privatisation through selling shares to the public on either Shanghai Stock Exchange (SSE) or Shenzhen Stock Exchange (SZSE) established in early 1990s. The emerging modern corporation era has motivated researchers to focus on pay-performance relations in Chinese listed firms. Kato and Long (2006) are among the first to estimate both the pay-performance sensitivity and pay-performance elasticity for Chinese listed firms. They measure executive compensation as the average value of total annual cash compensation of the top three highest-paid executives over the period 1998-2002. Both the pay-performance sensitivity and the pay-performance elasticity are statistically significant and positive in Kato and Long (2006), but the relation of pay and performance is negatively affected by state ownership.

Similar to Kato and Long (2006), Firth, Leung, et al. (2010) also measure executive compensation as the average compensation of the three highest paid executives, and estimate both the pay-performance sensitivity and the pay-performance elasticity following Murphy (1999). Using a more updated sample consisting of 4,233 firm-year observations during 2000-2005, they find a positive but weak pay-performance relation. Specifically, an executive receives an additional 0.0039 Yuan in pay, resulting from a 1000 Yuan increase in shareholder wealth. This is similar to that in the U.S. in the 1970s as reported by Murphy (1999). According to Murphy (1999), a 1000 dollars increase in shareholder wealth will result in an additional 0.0042 dollars in CEO compensation at companies in the U.S. in the 1970s. Unlike Kato and Long (2006), Firth, Leung, et al. (2010) do not observe a significantly different pay-performance relation between privately-controlled and state-controlled companies. However, the relation of compensation and company performance tends to be affected by the development of region. According to Firth, Leung, et al. (2010), the pay-performance link is slightly weaker for companies located in less developed provinces.

Consistent with Kato and Long (2006) and Firth, Leung, et al. (2010), Conyon and He (2011) defines executive compensation as the average compensation of the top three highest paid executives. In contrast to prior literature in the context of China, Conyon and He (2011) employ the fixed-effect panel data method to control for heterogeneity in

company and managerial quality. Using a sample of 5,928 firm-year observations covering 1,342 Chinese listed companies during the period 2001-2005, Conyon and He (2011) find that executive compensation is positively linked to company performance, consistent with agency theory and prior literature in the context of China (e.g. Kato & Long, 2006; Firth, Leung, et al., 2010). In addition, they observe that ownership structure and board composition appear to play important roles in determining the pay-performance link. Specifically, the pay-performance link is higher at companies with more independent directors on the board, and in privately controlled companies (Conyon & He, 2011). A comparison of CEO compensation in China and the U.S. is also documented in Conyon and He (2011). In particular, the level of CEO cash compensation (i.e. salary and bonus) in the U.S. is found to be around seventeen times higher than that in China (Conyon & He, 2011). In addition, they find that company stock returns tend to have greater influence on CEO compensation in the U.S. than that does in China.

A few studies on the relation of compensation level and company performance in the context of China focus on CEOs only. Firth et al. (2006) use two different regression models. They regress compensation levels on company performance, and they also regress changes in the compensation level on the change in company performance. Using a three year sample including 1,647 firm-year observations across 549 firms from 1998 to 2000, they find a positive pay-performance relation for CEOs at Chinese listed firms, but the significance of the pay-performance link depends on the types of the firms' dominant shareholders. To be specific, firms in which a SOE is the dominant shareholder tend to tie their CEO's incentive pay to accounting-based performance, whereas firms with a private dominant shareholder prefer the stock market-based performance (Firth et al., 2006). In addition, Firth et al. (2006) demonstrate that the pay-performance relation is weakened if the state agency (e.g. the state asset management bureaus and local finance bureaus) is the dominant shareholder.

Firth et al. (2007) use the same sample to estimate the determinants of CEO compensation in Chinese listed companies. However, they employ the longitudinal regression rather than the cross-sectional regression in Firth et al. (2006). Firth et al. (2007) find that CEO compensation is significantly sensitive to company accounting-based performance (i.e. ROA), but there is no significant relation between stock return and CEO compensation. In addition, companies with the presence of foreign shareholders, with a large proportion of non-executive directors, or with separated CEO

and board chairman, are more likely to adopt performance-related compensation scheme (Firth et al., 2007).

It is important to know that both Firth et al. (2006) and Firth et al. (2007) use the compensation of the highest paid executive in the company as the proxy for CEO compensation, without controlling for any personal characteristics. However, one might argue that using firm-level data on the highest paid executive might be problematic if there is a different individual involved each time (Conyon, Gregg & Machin, 1995; Conyon & Sadler, 2001). In addition, Conyon (1997) argues that the definition of the highest paid director in company accounts may not be in accordance with the theoretically relevant CEO. For instance, a company may have a more highly paid chairman and a separate CEO (Conyon, 1997). This problem is eliminated by Conyon and He (2012) who employ data on individual CEOs to control for the effects of individual CEO's attributes on compensation levels. Using a sample of 12,144 CEO-year observations from 2,104 unique publicly traded companies in China from 2000 to 2010, they find that CEO pay is positively related to both the accounting-based and stock market-based performance, but the pay-performance relation is much stronger when using accounting-based performance.

3.3.3 Summary

In summary, research on the relation of compensation level and company performance has been well developed in the U.S. and the U.K. Previous studies normally use a reduced-form linear model to estimate an average pay-performance link, and a low pay-performance relation is found. However, empirical results show that this relationship has been strengthened due to the increased use of equity-based compensation. In terms of other transitional economies such as China, studies on the pay-performance relation are emerging, and seem to be insufficient. Empirical literature in the context of China has revealed a positive relation of compensation and performance, based on data either on SOEs before the establishment of the stock market (e.g. Groves et al., 1995; Mengistae and Xu, 2004) or on publicly traded companies (e.g. Kato and Long, 2006; Firth et al., 2006; 2010; Conyon and He, 2011; 2012). In addition, other factors such as board characteristics and ownership structure are found to play intervening roles in determining the pay-performance relation. In particular, large state ownership, which is unique in the context of China, has been found to influence the pay-performance relation negatively.

Prior literature regarding the pay-performance link in the context of China normally has the following features. First of all, a part of early literature is only able to use the firm level data. In particular, they either define compensation as the average compensation of the top three highest paid executives at each firm (e.g. Kato & Long, 2006; Firth, Leung, et al., 2010; Conyon & He, 2011) or use the compensation of the highest paid person at individual firms to measure CEO compensation (e.g. Firth et al., 2006; 2007), due to the early weak compensation disclosure system in China. However, both of them might be potentially problematical in estimating pay-performance relation. On one hand, as argued by Buck et al. (2008), using average compensation of the top three highest paid executives may result in a limited power to estimate the complex pay-performance link, as this compensation measurement is lacking variation when compared with individual compensation. On the other hand, using the compensation of the highest paid person may also be a problem as the actual compensation time series might represent compensation to different individuals in different years (Conyon & Sadler, 2001), and the highest paid director in the company may not be the actual CEO. For example, a company may have a more highly paid chairman and a separate CEO (Conyon, 1997). Last but not least, it might be difficult to control for the potential influence of individual managerial attributes on compensation when using either the average compensation of the top three highest paid executives at each firm or the compensation of the highest paid person at individual firms.

Secondly, a few of studies focus on CEOs only. However, focusing on CEOs alone may result in inconclusive results (Carpenter & Sanders, 2002) as companies are run by the executive team. As argued by Goldberg and Idson (1995), it might be misleading to let the CEO represent the whole executive group since agency effects are not uniform across executive groups. Finally, excluding non-CEO executives does not allow researchers to estimate how compensation level and pay-performance relation vary within an executive team.

Finally, the potential endogeneity problem resulting from the two-way causality between compensation and performance is normally ignored by most studies in the context of China. However, ignoring the endogeneity of performance may overestimate the effects of performance on pay (Buck et al., 2008). Some studies use one year lagged independent variables to ameliorate statistical problems arising from joint endogenous determination. However, this solution may lead to precision loss in some cases and the interpretation will be a bit more difficult (Shepherd, 2009).

This study adds to the compensation literature by filling the research gap mentioned above. Firstly, compensation data for individual executives is used in this study. This enables the current study to control for the potential influence of individual managerial attributes on compensation, and to remove any bias resulting from the measurement error of the compensation that might affect estimating the pay-performance relation (Conyon & He, 2012). Secondly, it includes executives across different hierarchical levels within the company rather than CEOs alone. Including non-CEO executives allows this study to control for the different agency effects across executive groups, and to observe how pay-performance relation varies with different hierarchical levels. Finally, this study attempts to employ valid instrumental variables and the two-stage least squares estimator to control for the potential endogenous problem arising from the joint determination between compensation and performance.

3.4 Executive Compensation and Hierarchical Levels: Empirical Studies

In marked contrast to the large number of empirical papers on pay-performance link based on classical principal-agent theory, there have been few empirical studies attempting to explain executive compensation from the tournament perspective. However, a growing body of empirical evidence suggests that the pattern of incentives within companies may be explained by tournament related mechanisms (Conyon & Sadler, 2001).

3.4.1 Empirical Studies in Developed Countries

Leonard (1990) takes advantage of the survey data of 20,000 executives from 439 large U.S. corporations between 1981 and 1985 to examine the role of hierarchical structure in determining executive compensation. Leonard (1990) finds that executive compensation is highly hierarchically determined. Specifically, compensation of executives at flat companies (i.e. with only one subordinate level of management) is 32 percent lower than executives at hierarchical companies (i.e. with five levels of subordinates). In addition, consistent with tournament theory, Leonard (1990) presents evidence to suggest that pay differentials across levels are an increasing function of organisational hierarchy.

The evidence that pay differentials between adjacent positon levels increases as one moves up the organisational hierarchy found in Leonard (1990) is further supported by Lambert et al. (1993). However, Lambert et al. (1993) differ from Leonard (1990)

through using a more comprehensive measure of total executive compensation and a more comprehensive set of explanatory variables in the regression. Lambert et al. (1993) attempted to evaluate the ability of tournament theory to explain levels of executive compensation using a sample of executives across four levels of positions (including plant manager, divisional CEO, group CEO and corporate CEO) from 303 large publicly traded firms in the US during mid-year 1982-1984. They observe that the level of executive compensation and hierarchical levels has a convex relationship, as predicted by tournament theory. In addition, Lambert et al. (1993) present the evidence that the compensation differences between the corporate CEO and vice presidents are an increasing function of the number of vice presidents. This empirical evidence supports the prediction of tournament theory that the size of the prize should increase with the number of contestants.

The operation of a tournament in the context of U.S. companies is also investigated by Main et al. (1993) who use survey data of more than 200 companies from 1980 through to 1984. Consistent with Lambert et al. (1993), Main et al. (1993) support the tournament theory through observing that moving up in hierarchical levels is associated with a marked increase of compensation, and there is a significant positive influence of the number of vice-presidents on pay gap between CEO and vice-presidents. Specifically, the size of increment in cash compensation is about 138,000 dollars with an additional contestant. However, the efficiency of compensation dispersion on improving firm performance as predicted by tournament theory receives less support from Main et al. (1993). Specifically, compensation dispersion is found to be positively, but only weakly, associated with company performance.

Eriksson (1999) provides a more comprehensive test of multiple predictions of tournament theory through estimating the executive compensation in Denmark. Using a sample of around 2,600 executives from 210 Danish firms during a four year period from 1992 to 1995, Eriksson (1999) provides empirical findings in which almost all of them are in support of tournament theory. First of all, he finds that both the compensation level and compensation differences increase as one moves up the hierarchical levels. In particular, moving from a vice-president to CEO position results in a 37.2 percent increase of compensation. In addition, similar to Main et al. (1993), Eriksson (1999) provides an empirical result consistent with the prediction of tournament theory that there is a positive relationship between the number of contestants and the size of prize. Specifically, it is found that the wage spread becomes

larger if the number of managers considered to have significant responsibilities in the firm is getting larger. Eriksson (1999) also finds that larger pay dispersion exists at companies with that experience higher degrees of volatility in sales. However, in contrast to Main et al. (1993), Eriksson (1999) observes that larger managerial pay differentials significantly improve company performance.

Following prior literature (e.g. Main et al., 1993; Eriksson, 1999), Conyon et al. (2001) constructs the first study on the operation of tournaments in the context of U.K. In contrast to prior studies on executive compensation from tournament perspective, Conyon et al. (2001) measure the total executive compensation through combining cash compensation with the Black-Scholes valuation of stock option grants. Using a sample of a hundred U.K. companies during the period 1997-1998, Conyon et al. (2001) test all three predictions of tournament theory. First of all, it supports the tournament theory prediction that pay differentials between adjacent levels increase as an executive moves up the hierarchical levels. Specifically, Conyon et al. (2001) find that moving from the division CEO position to the corporate CEO means approximately a 60 percent increase in compensation level. In addition, consistent with tournament theory and prior literature, Conyon et al. (2001) observe that the tournament prize gap is increased by about 3.5 percent with one additional contestant. However, Conyon et al. (2001) do not find empirical evidence to support tournament theory's prediction that compensation variation positively affects firm performance. They explain that the absence of such empirical support might be because of the exclusion of the measure of executive interdependence.

The operation of tournament theory tends to be moderated by other factors. Vieito (2012) indicates that tournament theory is predominant in firms managed by males. Specifically, he finds that the total compensation gap between the CEO and vice-presidents tends to be larger at companies managed by a male CEO than companies managed by a female CEO.

Although a number of studies has offered strong empirical evidence in favour of a tournament model, some scholars question the use of tournament mechanisms in providing incentives for executives. One of the limitations of tournament model is that the interdependent work among executives may result in potential collusions to mitigate executives' effort levels. As argued by Eriksson (1999), the senior executives within a company normally perform highly interdependent work through working as a team.

This may in turn lead to potential collusion among tournament contestants to reduce their effort levels (Dye, 1984). Baker, Jensen, and Murphy (1988) argue that the single-period tournaments framework produced by Lazear and Rosen (1981) masks many of the complexities and inherent disadvantages of actual promotion systems. For instance, the promotion-based incentive system depends on the probability of promotion which, in turn, depends on the identity and expected horizon of the incumbent superior, and it also requires organisational growth to feed the reward system (Baker et al., 1988).

Empirical evidence also shows that tournament predictions regarding executive compensation may not be supported in real firms. As the pioneers who empirically test the tournament theory, O'Reilly III et al. (1988) estimate the operation of a tournament model in determining CEO compensation. Using data on 105 Fortune 500 firms, they find that CEO compensation is negatively influenced by the number of vice presidents, exactly the opposite to the prediction of tournament theory.

The test of tournament theory conducted by Main et al. (1993) is re-examined by Bognanno (2001) who takes advantage of individual executives at more than 600 U.S. companies for eight years between 1981 and 1988. Consistent with Main et al. (1993) and the predictions of tournament theory, Bognanno (2001) finds that a large reward is associated with promotion to a higher position level within the same firm. However, the additional evidence that promoted executives appear to be compensated above average in their level before promotion challenges the tournament explanation of CEO compensation (Bognanno, 2001). In addition, Bognanno (2001) observes that both the level of CEO compensation and the compensation gaps between CEO and vice-presidents increase with the number of competitors, but decrease with the square of the number of competitors, contradicting the prediction of the tournament model that the size of the winner's prize should increase with the number of competitors.

The tournament related literature reviewed above has been focusing on the relationship between compensation level and hierarchical levels, the effects of the number of contestants on prize size, the influence of pay dispersion on firm performance, and the role of other factors in intervening the validity of tournament. However, as the within-firm variation in compensation level predicted by tournament theory, compensation structure may also vary among different hierarchical levels for the following reasons.

First of all, as argued by Gibbs (1995), within-job pay for performance[8] should vary individualistically with differences in promotion opportunities. Specifically, to compensate for the lost promotion opportunities at higher hierarchical levels, compensation needs to be tied more closely to company performance (i.e. greater financial incentives) to provide an incentive for effort (Ortín-Angel & Salas-Fumás, 1998; Conyon & Sadler, 2001; Boschmans, 2008). In addition, executive hierarchical level plays an important role in explaining compensation structures because the importance of decision making differs across executive hierarchical levels within the company (Barron & Waddell, 2003; Ederhof, 2011). Finally, financial incentives and internal labour markets are viewed as complements in which bonus payments increase upward alongside the hierarchical level within a company (Kräkel & Schöttner, 2012; Grund & Kräkel, 2012).

Early empirical studies have been focusing on the relationship between bonus payments and promotion opportunities through combining agency theory and internal labour market theories. Gibbs (1995) presents a model that shows how the firm trades off the within-job pay for performance incentives and promotion-based incentives. In particular, the model predicts that with-job pay for performance will be smaller at hierarchical levels in which the promotion opportunities are important. Using personnel data on managerial employees ranging from entry management (i.e. Level 1) to CEO level (Level 8) at a typical large hierarchical company during the period 1969-1988, Gibbs (1995) attempts to test whether the likelihood of receiving a bonus and the size of the bonus vary with hierarchical levels. However, he does not find much support for the prediction that firms design individual incentive schemes to balance within-job incentive compensation and promotion incentives.

Using the model proposed by Gibbs (1995), Ortín-Angel and Salas-Fumás (1998) employ a sample of 6,957 top and middle managers from 475 companies in Spain to test two predictions related to the relation of bonus payment and hierarchical levels. First of all, Ortín-Angel and Salas-Fumás (1998) argue that as the opportunities for further promotion are diminished at higher hierarchical levels, the size of bonus should increase as the hierarchical level rises. In addition, the costs of supervision tend to be higher at higher hierarchical levels because managerial tasks become less programmable and less structural as one moves up to the higher hierarchical level (Calvo & Welliz, 1979).

[8] Gibbs (1995) refers to 'within-job' rewards as merit raises and bonuses earned in the current job when there is no promotion.

Accordingly, managers at higher hierarchical levels tend to have a higher probability of receiving a bonus. Both predictions are supported in Ortín-Angel and Salas-Fumás (1998).

Based on the multi-stage tournament model in Rosen (1986), Ekinci (2011) develops a dynamic tournament model which offers a rationale for why bonuses increase with hierarchical level. According to Ekinci (2011), bonuses increase with hierarchical levels because returns to effort increase with job level and pay tied to performance increases with returns to effort. In order to test the dynamic tournament model's prediction that bonuses paid to workers of the same age group increase with hierarchical levels, Ekinci (2011) employs the personnel data previously used in Baker, Gibbs, and Holmstrom (1994) and Gibbs (1995). Specifically, the sample consists of 6,809 individual-year observations at a hierarchical company in the financial services industry in the U.S. during the period 1969-1988. Ekinci (2011) produces empirical evidence to support the dynamic tournament model's prediction that bonuses increase as one climbs up the hierarchical level. Specifically, bonuses increase by 33 percent if one moves up to one level above, and the differentials of bonuses increase dramatically at higher levels. In particular, bonuses at the highest hierarchical level are 267 percent higher than that at the bottom level.

The positive relationship between bonus pay and hierarchical level is also supported by Grund and Kräkel (2012) who employ two measures of the intensity of bonus pay:

1. Whether an executive has a bonus contract or not;
2. The fraction of bonus of an executive's total annual compensation (i.e. bonus income relative to total compensation).

Using a sample consisting of highly qualified professionals and executive staff from the German chemical industry, Grund and Kräkel (2012) find that executives at higher hierarchical level are more likely to have a bonus contract, and the fraction of bonus payments in total annual compensation is greater at higher executive position hierarchy.

In order to investigate how pay-performance sensitivity (PPS) varies across executives at different position hierarchies within the firm, Conyon and Sadler (2001) utilise a sample consisting of 532 executives at a hundred large listed companies in the U.K. in the fiscal year 1997 and compute the aggregate PPS for each of the 532 executives separately. The empirical results in Conyon and Sadler (2001) show that executives at

the highest hierarchical level (i.e., Level 1) have higher PPS than executives at the second highest hierarchical level (i.e., Level 2), indicating that financial incentives increase with hierarchical levels.

Using a sample of 76,977 executive-year observations at publicly traded companies in the U.S. between 1992 and 2000, Barron and Waddell (2003) find that as an executive moves up in hierarchical level within the same firm, compensation becomes more incentive-based. To be specific, the proportion of total compensation that is incentive-based is increased by 49.1 percent as an executive moves from the bottom hierarchical level to the top level within the same firm. Barron and Waddell (2003) also observe that the incentive pay becomes more equity-based as one is promoted to a higher hierarchical level. In particular, moving from the bottom hierarchical level to the top level within the same firm increases the proportion of incentive pay that is equity-based by 70.9 percent.

The complementary relationship between implicit promotion-based incentives and explicit incentive contracts is also found by Ederhof (2011) who used a sample of 1,151 mid-level managers from fourteen countries largely for the year 2008. He shows that the incentives provided by the company's bonus plan are stronger for managers at higher hierarchical levels. Ederhof (2011) also finds that executives facing weaker implicit incentives from getting promoted to the next level or the top of the organisation have less bonus-based incentives.

3.4.2 Empirical Studies in China

Studies on the role of the tournament in explaining executive compensation in China are rather limited. However, Lin et al. (2011) argue that it is of importance to test whether Chinese listed firms have started to design an executive compensation structure as seen in developed economies because the development of a managerial labour market is critical to a market-oriented economy.

Lin et al. (2011) are among the first to comprehensively examine the operation of tournament theory in the context of China. Using a sample of 17,178 individuals (including executives, non-executive directors and members on the supervisory board) from 1,386 publicly listed companies in China during 1999–2006, Lin et al. (2011) provide empirical evidence to support predictions of the tournament theory. First of all, Lin et al. (2011) observe that compensation is an increasing function of hierarchical

levels. In addition, there is a skewed distribution towards the top of the firm, with the pay gap between the first level and the second level being the largest (Lin et al., 2011). Moreover, they find that the size of the compensation differentials between the first level and the second level increases with the number of contestants. Finally, in Lin et al. (2011), compensation dispersion is found to positively affect company performance.

As mentioned early, Lin et al. (2011) put together executives, non-executive directors and supervisors in their sample. However, Chen et al. (2011) argue that the key predictions of tournament theory pertain to executives who make decisions, rather than non-executive directors who are supposed to only offer advice and supervision. Therefore, Chen et al. (2011) further test the predictions of the tournament model by focusing on executives only. Using compensation data for individual executives from Chinese listed companies during the period 1999-2009, Chen et al. (2011) find that there is a convex relationship between the level of compensation and the level of hierarchy. In addition, company performance is found to be positively influenced by compensation differentials. However, Chen et al. (2011) do not observe a direct relationship between the size of tournament prize and the number of contestants.

Although the operation tournament in Chinese listed companies has been partly supported by empirical evidences, prior literature has shown that the validity of a tournament model is moderated by other factors which might be unique or emerging in China. In particular, ownership structure and enriched managerial power during the economic reform have significant effects on the efficiency of tournament related incentives.

Using data covering more than 900 Chinese listed firms from 1998 to 2002, Kato and Long (2011) attempt to examine whether a promotion tournament serves as a potentially important incentive mechanism for executives in the context of China. In particular, they estimate whether ownership structure moderately influences three previously-tested predictions of tournament model. Kato and Long (2011) observe that the sensitivity of the size of prize to the number of the contestants is significantly greater at companies which have less state ownership. They also find that firms with a lower proportion of shares owned by the state have higher sensitivity of the prize size to the market volatility (measured by the coefficient of variation of sales over the last three years). Finally, the positive effect of compensation dispersion on company performance is found to be greater in companies that are less state-controlled.

The moderation effects of state ownership on validity of tournament theory are also supported by Chen et al. (2011) who employ compensation data of individual executives rather than the aggregate remuneration used in Kato and Long (2011). To be specific, Chen et al. (2011) find that pay differences between adjacent hierarchical levels are reduced by higher state ownership. In addition, consistent with Kato and Long (2011), Chen et al. (2011) observe that the relationship between the size of the prize and the number of contestants is significantly weaker in companies which are more state-owned, and higher state ownership also mitigate the positive influence of compensation dispersion on company performance. As suggested by Kato and Long (2011), the negative influences of state ownership on the validity of tournament theory point to the necessity of ownership restructuring in the transitional economies, in order to develop efficient modernised corporations.

Managerial power is also shown to have an effect on the operation of the tournament model in Chinese listed firms. Lin and Lu (2009) use three dummy variables to measure managerial power: whether CEO and the board chairman is the same person, whether a CEO have been in charge prior to IPO and four years after IPO, and whether the ownership of the largest shareholder is lower than the ownership of the remaining top ten shareholders. Using a sample of 3,110 firm-year observations in China between 2001 and 2004, they find that companies with greater managerial power appear to have a larger compensation gap between the average pay for the top three highest paid executives and the average pay for the remaining senior executives. Lin and Lu (2009) also suggest that the positive effect of a compensation gap on firm performance is stronger at firms with higher managerial power, although managerial power itself has a negative effect on firm performance.

3.4.3 Summary

Tournament theory views an internal compensation scheme as a series of tournaments in which executives compete against one another at a given hierarchical level. The winner of the tournament is promoted to a higher hierarchical level and gets higher compensation associated with the promotion (Rosen, 1986). In particular, the higher compensation at higher hierarchical levels is to compensate for the lost promotion opportunities (Lazear & Rosen, 1981).

Studies on the operation of the tournament in the context of executive compensation are relatively limited, compared with the extensive literature based on the classical

principal-agent theory. Within the limited literature, there are few empirical studies of China. Although empirical results regarding the operation of the tournament in the context of executive compensation are mixed, there have been a growing number of studies which provide empirical evidence in favour of predictions of the tournament model. Specifically, prior literature has been focusing on the following predictions of a tournament model:

1. First of all, executive compensation should be an increasing function of hierarchical level (e.g. Lambert et al., 1993; Eriksson, 1999; Conyon & Sadler, 2001; Lin et al., 2011), and the increases of compensation and hierarchical level have a convex relationship (e.g. Main et al., 1993; Lambert et al., 1993; Conyon et al., 2011);

2. Secondly, the size of tournament prize should increase with the number of competitors (e.g. Eriksson, 1999; Main et al., 1993; Conyon & Sadler, 2001; Lin et al., 2011);

3. Thirdly, compensation differentials among top executives should provide effective incentives to improve corporate performance (e.g. Main et al., 1993; Eriksson, 1999; Lin et al., 2011; Chen et al., 2011).

Other factors such as gender (Vieito, 2012), ownership structure (Kato & Long, 2011; Chen et al., 2011), and managerial power (Lin & Lu, 2009) are also found to play an intervening role in the operation of tournament in real companies.

In contrast to the variation of compensation levels across various hierarchical levels, prior literature has theoretically and empirically suggested that compensation structure also varies across hierarchical levels (e.g. Gibbs, 1995; Conyon & Sadler, 2001; Barron & Waddell, 2003; Ederhof, 2011; Kräkel & Schöttner, 2012), but none related to the context of China.

This study attempts to fill the research gap in two ways. First of all, it employs more complete and updated data on individual executives to test whether executive compensation is an increasing function of position hierarchy with the listed companies in China. In particular, it differs from Lin et al. (2011) by focusing on executives only. It is also different from Chen et al. (2011) as this study classifies the hierarchical levels depending on executives' position titles and responsibilities, whereas Chen et al. (2011) classify the hierarchical levels based on executive's compensation level. In addition, as

the variation of compensation structure across hierarchical levels in the context of China has been omitted by prior literature, this study is a preliminary step in the direction of filling this gap by estimating how the pay-performance link and the adoption of equity-based compensation vary across executive hierarchical levels.

3.5 Executive Compensation and Remuneration Committee: Empirical Studies

Previous studies have examined the role of the remuneration committee in determining executive compensation level and structure. Although a group of studies argue that the remuneration committee should enhance corporate governance effectiveness through assisting in the board of directors' monitoring and designing compensation scheme benefiting for mitigating interest-conflicts between managers and shareholders and reducing agency costs (e.g. Newman & Mozes, 1999; Anderson & Bizjak, 2003; Sun & Cahan, 2009), the managerial power perspective argues that executives can get their favourable compensation packages by taking advantage of their power to influence the remuneration committee in setting a compensation plan (e.g. Conyon & He, 2004; O'Reilly et al., 1988). In particular, managerial power to influence over compensation settings is closely related to the makeup of the remuneration committee itself (Bebchuk & Fried, 2004). Does prior literature show that the remuneration committee indeed aligns with executives as predicted by the managerial power model or does it work for the best interests of shareholders to design an optimal contract?

3.5.1 Empirical Studies in Developed Countries

The recommendations regarding the presence of the remuneration committee and its composition by the Cadbury Report (1992) motivate a number of researchers to test the practical role of the remuneration committee in determining executive compensation in U.K. companies. Main and Johnston (1993) test the influence of the remuneration committee on executive compensation levels and structure in a sample of 220 large publicly traded companies in the U.K. in 1990. The empirical evidence obtained from cross-sectional analysis shows that the highest paid directors in companies with the presence of a reported remuneration committee receive compensation which is 21 percent higher than those in companies without a remuneration committee. However, the declared existence of the remuneration committee does not seem to play a significant role in increasing the proportion of total compensation which is in the form of stock options for the highest paid directors. In addition, both the compensation level and pay structure are not significantly influenced by whether the highest paid director

holds the remuneration committee membership, according to Main and Johnston (1993). In contrast, using a sample of 213 large U.K. listed companies during the period 1988-1993, Conyon (1997) observe that top executives at companies with the presence of the remuneration committee tend to have lower growth rates of compensation. To be specific, the empirical results of first difference regression show that pay growth appears to be about 2.6 percent lower in companies which have adopted a remuneration committee during the sample period.

Using a sample of publicly traded companies from the U.K. Financial Times Top 100 companies, Conyon and Peck (1998) examine the role of the remuneration committee in shaping top management compensation via the panel data econometric technique. In addition to the effects of the adoption of the remuneration committee which has been tested by prior British literature, they also estimate whether the composition of the remuneration committee affects top management compensation. Following prior literature in the U.K. (e.g. Main & Johnston, 1993; Conyon, 1997), Conyon and Peck (1998) measure compensation as the total cash compensation including salary, bonus, and other earnings of the highest paid director within a company. Consistent with Main and Johnston (1993), Conyon and Peck (1998) observe that executives in companies with the remuneration committee appear to obtain higher compensation. In addition, the pay-performance link is stronger in companies in which a higher proportion of outside directors are on the remuneration committee (Conyon & Peck, 1998).

The U.S. government intervention in designing remuneration committee structure through a series of regulatory reforms in the early 1990s motivates more researchers to focus on the relation of remuneration committee independence and executive compensation. Daily, Johnson, Ellstrand, & Dalton (1998) extend prior compensation literature by employing various measurements of the remuneration committee characteristics (including the proportion of affiliate directors, the proportion of interdependent directors, and the proportion of external CEOs on the remuneration committee) and multiple measures of compensation (including absolute pay levels, changes in pay, and pay ratios) to estimate the role of the remuneration committee in shaping CEO compensation. Using a sample of 194 U.S. publicly traded companies from the 1992 Fortune 500, they do not find a close relationship between CEO compensation and the composition of the remuneration committee. This empirical finding is robust to different measures of CEO compensation. Therefore, Daily et al.

(1998) suggest that certain types of directors such as affiliated and interdependent directors might be less likely to effectively execute obligations to shareholders.

Newman and Mozes (1999) explore the relationship between the composition of the remuneration committee and CEO compensation practice in a sample of 161 listed companies from the 1992 Fortune 250. They observe that the pay-performance link for CEOs in companies with the insider-influenced remuneration committee (i.e. at least one insider serving on the remuneration committee) is weaker than that in companies with the outsider-influenced remuneration committee (i.e. no insiders serving on the remuneration committee), although they do not find significant differences of pay levels between those two groups of companies.

Using a fourteen-year panel data including 1,376 firm-year observations in the U.S. between 1995 and 1998, Anderson and Bizjak (2003) also examine the influence of remuneration committee independence on CEO compensation. The empirical results of the two-way fixed-effect (i.e. industry fixed-effect and time fixed-effect) model indicate that both the compensation level and the pay-performance sensitivity are unrelated to the independence of the remuneration committee, but CEO ownership is greater when insiders serve on the remuneration committee. Anderson and Bizjak (2003) also expect lower levels of fixed pay, greater levels of equity-based pay, and closer pay-performance link after CEO comes off the remuneration committee. However, those are not empirically supported.

Vafeas (2003) further examines the relation of insider membership on the remuneration committee and CEO compensation using more than 1,500 firm-year observations for 271 U.S. companies from 1991 to 1997. In contrast to Newman and Mozes (1999), who find that CEOs in companies with an insider-influenced remuneration committee have a weaker pay-performance link than those in companies with an outsider-influenced remuneration committee, Vafeas (2003) observes small differences in CEO pay level and pay-performance sensitivity between those two groups. However, significant differences are found before the reforms, given the regulatory reforms by the U.S. Securities and Exchange Commission (SEC) and the Internal Revenue Service (IRS). Specifically, Vafeas (2003) finds that before the reforms, companies with insiders' participation in the remuneration committee provide more fixed compensation and less contingent compensation for CEOs, but for these companies, the pay-performance sensitivity and the proportion of contingent pay both increase after the reforms.

Using a sample of U.S. firms between 1998 and 2003, Conyon (2006) tests the relation of the involvement of affiliated directors in a remuneration committee and CEO compensation. Inconsistent with a managerial power based prediction that affiliated directors are more likely to set compensation more favourable to executives rather than shareholders, Conyon (2006) does not observe a relation between CEO compensation and the remuneration committee with affiliated directors. Specifically, both the level of total compensation and the aggregate incentive-based compensation are not influenced by affiliated directors' participation in the remuneration committee.

Most of the literature reviewed above examines the relation of the remuneration committee and executive compensation using data on large established companies. Conyon and He (2004) extended the literature by focusing on entrepreneurial companies. In particular, using a sample of 1,605 firm-year observations from more than 400 entrepreneurial companies during the period 1998-2001, they tested the effects of the remuneration committee on CEO compensation by contrasting the three-tier agency theory and the managerial power model. According to Conyon and He (2004), the three-tier agency theory argues that the principal (e.g. shareholders) delegate monitoring authority to a separate supervisor (e.g. the remuneration committee) who evaluates the agent (e.g. executives), and whether the remuneration committee works in the best interest of shareholders or colludes with the CEO depends on whether the remuneration committee's interests are more tightly tied to those of shareholders or executives. The three-tier agency theory is supported in their study. Specifically, Conyon and He (2004) observe that the presence of large shareholders on the remuneration committee leads to lower total compensation and higher equity incentives for CEOs, whereas the remuneration committee with higher paid members is associated with higher total compensation and lower equity-based incentives for CEOs. However, insiders or CEOs from other companies serving on the remuneration committee is not found to be associated with a higher level of total compensation and lower equity-based incentives for CEOs, indicating that the managerial power model is not supported in Conyon and He (2004).

More recently, Boyle and Roberts (2013) examine the influence of CEO-involved remuneration committee on CEO compensation in a sample of 447 firm-year observations covering 114 listed firms in New Zealand during the period 1998–2005. Inconsistent with the managerial power theory's prediction that CEO membership on the remuneration committee leads to rent extraction by self-serving executives, Boyle

and Roberts (2013) observe that CEOs at firms with CEO-involved remuneration committee experience annual pay increments which are around 4 percent less CEOs at other companies.

Sun and Cahan (2009) extend the literature by conducting a more comprehensive study on the effect of remuneration committee quality on the association between CEO cash compensation and accounting performance. In particular, the remuneration committee quality is measured by a composite score related to six characteristics of the committee. To be specific, the six characteristics of the remuneration committee include CEO appointed directors, senior directors (i.e. directors with more board experience), CEO directorship, director shareholdings, additional directorships, and the committee size (Sun & Cahan, 2009). Using a sample of 812 U.S. listed companies with remuneration committees consisting solely of independent directors in 2001, Sun and Cahan (2009) find that the pay-performance sensitivity is more positive for CEOs at companies in which the remuneration committee quality is higher. However, the positive influence of the remuneration committee quality on pay-performance sensitivity is alleviated by greater growth opportunities and loss-making.

3.5.2 Empirical Studies in China

In contrast to the extensive literature focusing on companies in developed countries, there are limited studies on the relation of the remuneration committee and executive compensation plans in the context of China, due to the limited data availability. Zhu et al. (2009) are among the first to estimate the effect of the remuneration committee on executive compensation plans in China. In their conference paper, Zhu et al. (2009) suggest that board independence and the presence of the remuneration committee jointly influence CEO compensation. Specifically, using a sample of Chinese manufacturing firms during 2001-2007, they find that in companies with the remuneration committee, compensation and company performance are more aligned when the proportion of independent directors on the board is larger. However, the proportion of independent directors serving on the remuneration committee is not found to have any impacts on the pay-performance link for CEOs (Zhu et al., 2009).

Later studies are confined to the presence of the remuneration committee. Using a sample of 5,928 firm-year observations from 1,342 Chinese listed companies from 2001 to 2005, Conyon and He (2011) demonstrate that the presence of the remuneration committee is associated with a higher level compensation for executives. Specifically,

executives in companies with the remuneration committee are paid approximately ten percent more than executives in companies without the remuneration committee. Similar results are found by Conyon and He (2012) using a sample of 2,104 companies with 12,144 CEO-year observations during the period 2005-2010. According to Conyon and He (2012), the empirical results obtained from the OLS regression show that CEO compensation is about 10 percent higher in companies which have adopted the remuneration committee, but the results are not robust to the fixed-effect estimator. Conyon and He (2012) also observe that CEOs in companies with the remuneration committee are more likely to receive equity incentives.

3.5.3 Summary

Prior literature has estimated the relation of the presence of the remuneration committee and executive compensation in developed countries, but the results are mixed. On one hand, some researchers find that executives in companies with the remuneration committee appear to get higher compensation (Main & Johnston, 1993; Conyon & Peck, 1998). On the other hand, companies with the remuneration committees are found to have lower growth rates of executive compensation (Conyon, 1997). In addition, prior studies provide inconclusive results on the influence of remuneration committee composition on pay-performance link. Some scholars observe that the remuneration committee which is more independent is associated with stronger pay-performance link (e.g. Newman & Mozes, 1999; Conyon & Peck, 1998), while others do not find a significant relation (e.g. Daily et al., 1998; Conyon & He, 2004; Conyon, 2006).

Studies on the effect of the remuneration committee on executive compensation in the context of China are rather limited. In particular, most studies are confined to the presence of remuneration committee due to the data availability. Although Zhu et al. (2009) test the relation of remuneration committee independence and pay-performance link in China, their study focuses on CEOs in manufacturing companies. In addition, none of the studies relate the remuneration committee composition to managerial power.

This study attempts to extend the literature by estimating the influence of remuneration committee composition on executive compensation in Chinese listed companies from the managerial power perspective. In particular, it measures executives' power to influence the remuneration committee from the following two aspects: the proportion of non-independent directors on the remuneration committee, and the size of the remuneration committee.

3.6 Equity-based Compensation and Company Performance: Empirical Studies

Executive compensation was mainly in the form of cash in the U.S. in the 1980s (Hall & Liebman 1998). According to Core, Guay, and Larcker (2003), there were only 30 percent of CEOs receiving new option grants in 1980s. Equity-based compensation became more and more pervasive in the 1990s, with 70 percent of CEOs receiving new option grants by 1994 (Core et al., 2003). The dramatic increase in the use of equity incentive in executive compensation portfolio in the U.S. in 1990s has attracted much attention of scholars. However, there has not been a consensus on the performance consequence of equity incentives.

3.6.1 Empirical Studies in Developed Countries

The question regarding the efficiency of equity-based compensation offered to executives and directors has generated considerable controversy, due to the financial scandals over the past few decades. Although prior literature (e.g. Baker et al., 1988) has theoretically suggested that equity-based compensation could flourish company performance, the existing empirical findings are conflicting.

A measurable body of literature finds a positive relation between equity-based compensation and company performance, consistent with the efficiency of equity incentives predicted by the economic theories. Using a sample of 153 randomly-selected manufacturing companies in the U.S. from 1979-1980, Mehran (1995) indicate that companies in which the percentage of executive equity-based compensation is greater tend to produce higher performance (measured by Tobin's Q and Return on Assets).

Using data on listed companies in the U.S in 1990s, Frye (2004) provides a more comprehensive estimation by testing the efficiency of equity-based compensation granted to all employees, rather than just executives. He divides the sample period into two parts: 1992-1994 and 1997-1999. For both sample periods, it is found that companies with a greater proportion of equity-based compensation for employees have the higher Tobin' Q (Frye, 2004). However, different results are observed when performance is measured by accounting returns (i.e. ROA). Specifically, Frye (2004) finds that greater use of equity-based compensation results in better ROA in the earlier sample period, but for the later sample period, the relation becomes negative.

In addition to the proportion of executive compensation that is equity-based, the value of granted stock option also seems to be associated with better future performance.

Hanlon, Rajgopal, and Shevlin (2003) test how the Black-Scholes' value of stock options granted to the top five executives relates to future operating earnings, on the basis of 2,627 firm-year observations covering 1,069 firms from 1997 to 2000. The empirical results indicate that stock option grants result in the large increase of future operating income, strongly consistent with incentive alignment (Hanlon et al., 2003).

The adoption of equity-based compensation tends to provide financial incentives for external directors, not just executives. Based on a sample of Fortune 1000 companies from 1997 to 1999, Fich and Shivdasani (2005) observe that the presence of outside directors stock option compensation indeed improves company performance in the U.S. Specifically, the market-to-book ratio and several accounting-based performance measures (i.e. return on assets, return on sales, and asset turnover) are higher in companies with the presence of stock option compensation for outside directors. In addition, the presence of outside directors stock option compensation produces positive cumulative abnormal returns (CARs). Finally, the event study by Fich and Shivdasani (2005) shows that stock price has a significantly negative reaction to the appointments of independent directors without stock option compensation.

Although a positive influence has been observed by a number of studies, some scholars argue that there is no simple ex-ante relationship between equity incentives and company performance because higher (lower) percentage of executive equities might be predicted and observed in companies where more (less) monitoring is required (Core et al., 2003). This perspective is empirically supported by Ittner, Lambert, and Larcker (2003), who examine both the accounting and stock-based performance consequences of equity-based compensation in new economic firms. Similar to Core and Guay (1999), Ittner et al. (2003) begin with a model to test the determinants of equity grants, and then regress the subsequent performance on the residuals estimated from that model. Specifically, positive (negative) residuals represent equity grants which are higher (lower) than predicted. Using survey data consisting of 217 new and unique economy firms in the U.S. during the period 1998-1999, Ittner et al. (2003) indicate that the subsequent accounting performance is lower when option grants for to CEOs, directors, and technical employees are lower than expected. In addition, lower than expected option grants by top five executives is associated with both higher accounting-based performance and stock returns. However, greater than expected equity grants have little influence on future performance.

Denis, Hanouna, and Sarin (2006) argue that equity-based compensation has a dark side. Using a sample consisting of 358 U.S. companies with fraud allegations between 1993 and 2002, Denis et al. (2006) find that the likelihood of securities fraud allegations is greater at companies in which the option intensity of the CEO's compensation is larger. Specifically, option intensity is defined as the sensitivity of the value of the executive stock option portfolio to changes in the company stock price.

3.6.2 Empirical Studies in China

Prior studies commonly focus on western countries, while studies on the influence of equity-based compensation on company performance in the context of China is far from sufficient and conclusive. One of important reasons might be the use of equity incentives in executive compensation portfolio is not as extensive as it would be in western countries. As mentioned before, there has been 70 percent of CEOs receiving new option grants by 1994 (Core et al., 2003). In contrast, the adoption of equity-based compensation just formally started in China in early 2006. In addition, the relatively weaker compensation disclosure system in China, although it has been improved, forms the obstacle to investigate the equity-based compensation.

So far, Lian et al. (2010) might be the only study on the effectiveness of equity incentives plans on company performance in China. Lian et al. (2010) divide the sample into two groups. The treatment group includes Chinese companies which have adopted equity-based compensation in 2006 and 2007, and the control group consists of matched companies which have not adopted equity-based compensation during the same period. They then analyse the performance of those companies in 2008 and 2009. The empirical results of the average effect of treatment on the treated (ATT) in Lian et al. (2010) suggest that company accounting-based performance is improved by the adoption of equity incentives. Yet, the effectiveness is greater in private companies than in state-owned firms. In addition, the effectiveness is stronger in companies with more diversified ownership. Finally, stock option incentive is more effective than other types of equity incentives in improving company performance.

3.6.3 Summary

Prior literature has not reached a consensus on the effects of equity incentives on company performance, although equity incentives are predicted to motivate executives to maximise shareholder value by the principal-agent theory (Core & Guay, 1999; Hall

& Murphy, 2003). On one hand, a measurable body of literature find a positive association between equity incentives and company performance to support the efficiency of equity incentives (e.g. Mehran, 1995; Frye, 2004; Core & Larcker, 2002; Fich & Shivdasani, 2005; Lian et al., 2011). On the other hand, it has been found that equity incentives have little influence on improving company performance (e.g. Ittner et al., 2003), and even has the dark side (Denis et al., 2006).

In addition, prior studies on performance consequences of equity incentives have been focusing on western countries, whereas related literature focusing on Chinese listed companies is extremely limited. This study has a great incentive to empirically estimate the causal effects of the adoption of equity-based compensation on company performance for Chinese listed firms, given the inconclusive findings in this area and the insufficient studies in the context of China.

3.7 Conclusion

This chapter reviews three important theories in the field of executive compensation, namely the classical principal-agent theory, the tournament theory, and the managerial power theory. As a dominant theory in executive compensation literature, the principal-agent model argues that executive compensation should be tied to performance to mitigate agency problem resulting from the potential interest-conflicts and the asymmetric information between executives and shareholders. However, the economic constraint of the classical principal-agent theory motivates scholars to consider the role of non-economic factors in explaining executive compensation. Two emerging theories have captured much attention. The tournament theory supplements to the agency theory through taking account of the role of hierarchical levels in explaining executive compensation. In contrast, the managerial power theory views executive compensation as a potential agency problem itself as managers may use their power to influence compensation plans to achieve rent extraction.

There have been extensive studies on the relation of compensation level and company performance drawing from the principal-agent theory (e.g. Murphy, 1985; Jensen & Murphy, 1990; Mehran, 1995). However, the relatively weaker pay-performance link observed motivates researchers to explore other determinants of executive compensation. A number of studies have been focusing on the relation of hierarchy levels and the level of compensation (e.g. Lambert et al., 1993; Eriksson, 1999), and a limited number of studies capture how compensation structure varies with hierarchy

levels (e.g. Conyon & Sadler, 2001; Ekinci, 2011; Grund & Kräkel, 2012). The role of the remuneration committee in determining executive compensation has also been tested in developed countries (e.g. Main & Johnston, 1993; Conyon & Peck, 1998; Newman & Mozes, 1999; Conyon, 2006), although the results are inconclusive. Finally, consistent with the principal-agent theory, prior literature has provided empirical evidences to support the effectiveness of equity-based compensation in improving company performance (e.g. Mehran, 1995; Frye, 2004).

In contrast to the plentiful literature in developed countries, executive compensation literature on China is less sufficient. Like studies in developed countries, the majority of studies in the context of China are rooted in the classical principal-agent theory and focus on the relation of compensation level and company performance. Although a positive pay-performance link has been observed in China (e.g. Conyon & He, 2011), the positive relation is found to be weak (e.g. Firth, Leung, et al., 2010), to be more robust to accounting-based performance (e.g. Conyon & He, 2012), and to be moderately influenced by ownership structure (e.g. Firth et al., 2006; Kato & Long, 2006). However, the potential endogeneity problem resulting from the two-way causality between compensation and performance is normally ignored by prior literature. In addition, prior studies on the relation of compensation and performance normally measure compensation as the average compensation of top three highest paid executives (e.g. Kato & Long, 2006; Firth, Leung, et al., 2010; Conyon & He, 2011), or use the compensation of highest paid director at individual companies to measure CEO compensation (e.g. Firth et al., 2006; 2007), because of the weak compensation disclosure system in China at early stage. This might be problematic if individual executive changes with time series as researchers are not able to control for the influence of managerial attributes on compensation. Moreover, some studies focus on CEOs alone (e.g. Conyon & He, 2012), but they may provide incomprehensive evidence which could not represent the whole executive group as agency effects are not uniform across executive groups (Goldberg & Idson, 1995).

In terms of the relation of hierarchical levels and executive compensation, empirical literature in the context of China is rather limited. Based on tournament theory, studies have estimated whether compensation level increases with the hierarchical level (e.g. Lin et al., 2011; Chen et al., 2011), and whether compensation differences incline with the rise of the hierarchical level (e.g. Lin et al., 2011) or the number of contests (e.g.

Chen et al., 2011). However, the question that how does compensation structure vary with hierarchical levels is omitted in prior literature in the context of China.

With respect to the role of the remuneration committee in determining executive compensation, studies in the context of China are rather limited, due to the limited data availability. Although it has been found that executives at Chinese listed companies with the presence of remuneration committee are more likely to receive higher cash compensation (e.g. Conyon & He, 2011), and are more likely to receive equity-based compensation (e.g. Conyon & He, 2012), remuneration committee independence does not tend to significantly affect compensation plans (e.g. Zhu et al., 2009). However, none of the studies relate the remuneration committee to the managerial power theory.

For the effectiveness of equity-based compensation in improving company performance, empirical literature in the context of China is very limited mainly for two reasons. On one hand, it might be because executive incentive in the form of equity-based compensation has a short history and is far from prevalent in China. On the other hand, the relatively weaker compensation disclosure system in China makes it more difficult to investigate the equity-based compensation.

This study aims to extend the executive compensation literature through filling the research gaps mentioned above. Based on three theories and extensive literature reviewed in this chapter, hypotheses are developed in the next chapter. Research methodology is also exposited in the next chapter.

Chapter 4: Research Hypotheses and Methodology

"All good intellects have repeated, sine Bacon's time, that there can be no real knowledge but that which is based on observed facts."

-Auguste Comte, French Philosopher, Founder of Positivism and Sociology, 1853[9]

4.1 Introduction

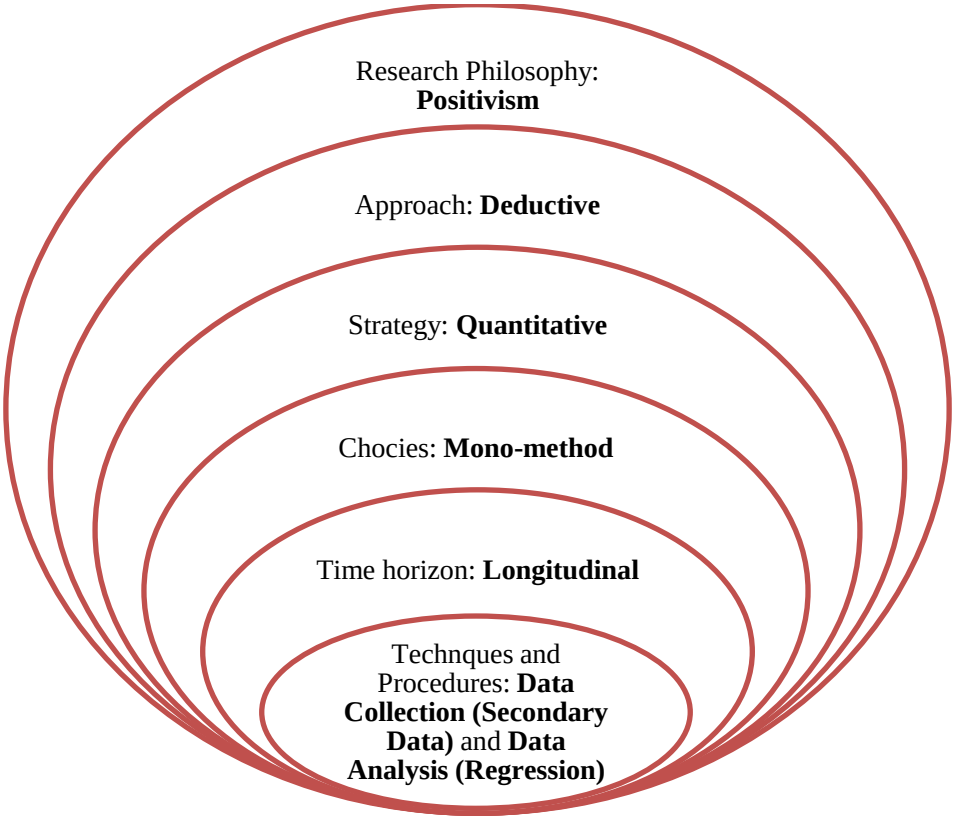
Chapter 3 reviewed related literature in the fields of executive compensation and identified research gaps including methodology. This chapter aims to present the methodology and to develop hypotheses for this study. Figure 4.1 vividly presents the overview of the methodology used in this study. Specifically, the philosophical position of this study is the positivist epistemology (i.e. positivism) together with the objective ontology and functionalist paradigm. Based on this research philosophy, this study employs the deductive approach in which hypotheses are developed based on existing theories and previous literature about executive remuneration. In particular, the hypotheses are developed based on three theoretical perspectives: principal-agent theory, tournament theory, and the managerial power theory. In order to test those hypotheses, this study chooses the mono quantitative method and utilises longitudinal secondary data.

In this study, the fixed-effect two-stage least squares (FE-2SLS) instrumental variables (IV) estimator is employed to test models regarding the determinant of compensation level and pay-performance link. An advantage of this method is that it accounts for endogeneity of company performance, as well as correlated unobserved heterogeneity (Semykina & Wooldridge, 2010). Standard errors are clustered by companies, and year dummies are included, in order to account for the cross-sectional dependence and the time-series dependence. In addition, logit models are employed to estimate determinants of the likelihood of receiving equity-based compensation. Finally, the propensity score matching is combined with difference-in-difference regression, when estimating the causal effect of adopting equity-based compensation on company performance. The

[9] Comte, A. (1853). *The Positive Philosophy*. London: John Chapman.

selection and measure of variables are consistent with prior literature, in order to increase the reliability of the measurements.

Figure 4.1
Research Onion



The rest of this chapter is organised as follows:

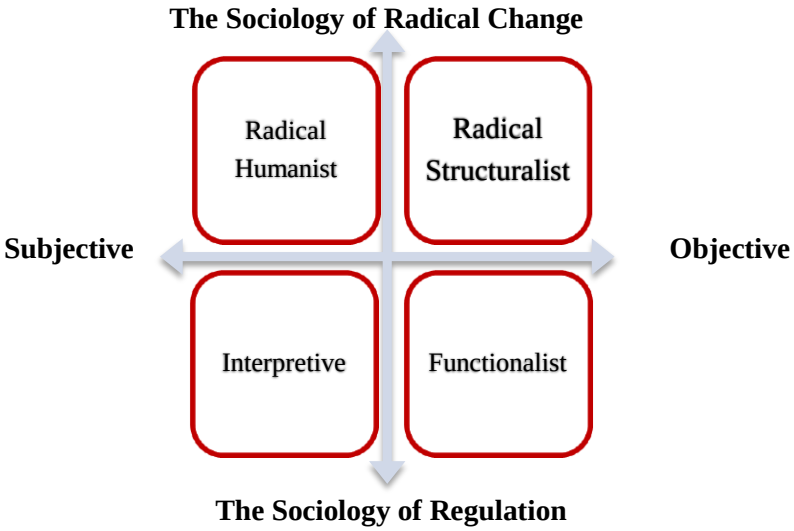
- Section 4.2 identifies the philosophical position of this study;
- Section 4.3 describes the research approach and method;
- Section 4.4 presents the time horizon and data;
- Hypotheses are developed in Section 4.5;
- Regression models utilised to test those hypotheses are presented in Section 4.6;
- Section 4.7 exposit estimating strategies;
- All the variables are defined in Section 4.8;
- Data source and sample selection is described in Section 4.9;
- Finally, Section 4.10 provides the conclusion for this chapter.

4.2 Research Philosophy and Paradigms

Saunders, Lewis, and Thornhill (2009) define research philosophy as an over-arching term relating to the development of research knowledge and the nature of that knowledge. Understanding research philosophy is important because the philosophical assumptions implicitly and explicitly made by researchers will significantly affect researchers' decisions on methodological issues (Morgan, 1983). In general, there are three ways to understand research philosophy: ontology, epistemology and methodology (Guba, 1990). Specifically, ontology is about what is out there to know, epistemology is about how do we come to know, and methodology means which tools (i.e. methods) we need to employ to know the reality (Grix, 2002). Normally, the ontology is divided into subjectivism and objectivism. The objectivism suggests that social entities exist independently of social actors, while the subjectivism advocates that social phenomena are attached to the perceptions and consequent actions of social actors (Saunders et al., 2009). The epistemology could be categorised into positivism, realism and interpretivism. The positivism supports the externality of the social world, and it holds the view that the properties of this external reality should be observed via objective methods (Easterby-Smith, 2002). Similar to positivism, the realism stems from the view that the reality is objective. Specifically, it argues that the true reality is exactly what the senses show us, i.e., what we know about an object exists independently of the human mind (Saunders et al., 2009). Standing opposite the positivism, the interpretivism (i.e. anti-positivism) believes that the reality is subjective. Accordingly, the interpretivists suggest that the researcher is part of what is being observed and science is mainly driven by human interests (Easterby-Smith, 2002).

Kuhn (1962) defines a paradigm as a set of beliefs and agreements shared between scientists about how problems should be understood and addressed. A research paradigm is of importance as it determines how the research questions could be estimated and explained. Burrell and Morgan (1979) summarise four sociological paradigms which define fundamentally different perspectives for the analysis of social phenomena: radical humanist, radical structuralist, interpretive, and functionalist. These four paradigms can be adopted in the business study to gain fresh insights into real-life matters and problems (Saunders et al., 2009). Figure 4.2 presents the relationship between these paradigms.

Figure 4.2: Four Paradigms for the Analysis of Social Theory



Source: Developed from Burrell and Morgan (1979, p.22)

As shown in Figure 4.2, the four paradigms are associated with two dimensions:

- The subjective and objective dimension;
- The regulation and radical change dimension.

The objective element in the first dimension, as mentioned earlier in this section, represents that social entities are independent of social actors, while the subjective supports the view that social phenomena are attributed to social actors' perceptions and consequent actions (Saunders et al., 2009). In the regulation and radical change dimension, regulation refers to the writings of theorists who try to explain the society with emphasis on its underlying unity and cohesiveness. In contrast, the basic concern of radical change is to look for the explanations for radical change, deep-seated structural conflict, modes of domination and structural contradiction of modern society (Burrell & Morgan, 1979).

Each paradigm aligns with its neighbour on one dimension but opposite to its neighbour on the other dimension, as shown in Figure 4.2. The radical humanist paradigm advocates the sociology of radical change from a subjectivist's perspective. To be specific, it mostly focuses on "radical change, modes of domination, emancipation, deprivation and potentiality" (Burrell & Morgan, 1979, p.32), based on the "human consciousness" (Burrell & Morgan, 1979, p.33). Similarly, the radical structuralist paradigm is also embedded in the sociology of radical change. However, theorists within this paradigm are within "a realist social world" (Burrell & Morgan, 1979, p.33)

as they stand from an objective perspective. The functionalist paradigm develops its sociological concerns from an objectivist standpoint as well, but it is committed to the sociology of regulation. This paradigm, in Burrell and Morgan (1979), states that the functionalist paradigm is "often problem-oriented in approach, concerned to provide practical solutions to practical problems" (p.26). In other words, by assuming the social entities are rational, researchers within this paradigm aim to solve the practical problems through offering explicit recommendations. The interpretive paradigm tends to advocate the sociology of regulation implicitly. Far from emphasising rationality, this paradigm seeks to discover irrationality (Saunders et al., 2009).

Relating the research philosophy to the current study, the ontological position of this study is objectivism which asserts that knowledge exists independently of the human mind (Grix, 2002), and the epistemology embedded in this study is the positivism which holds the views that the external reality should be observed using objective methods (Easterby-Smith, 2002). This study examines the determinants and consequences of executive compensation, and provides implications based on objectively observed facts. Therefore, the research paradigm of this study is functionalist.

4.3 Research Approach and Research Method

Research approaches are typically classified into two categories: the deductive approach and the inductive approach. The deductive approach "is concerned with developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis" (Wilson, 2010, p.7). By contrast, the inductive approach would collect data, analyse gathered data, and generate a theory to explain the results of data analysis (Saunders et al., 2009). In other words, the deductive approach moves from a more general level to a more specific one, whereas on the contrary, the inductive moves from the specific to the general level (Blackstone & Foundation, 2012). In the fields of corporate governance, researchers might only adopt either a deductive approach (e.g. Jensen & Murphy, 1994; Conyon & He, 2012) or an inductive approach (e.g. Samra-Fredericks, 2000; Parker, 2007), or they might combine two approaches (e.g. Currall, Hammer, Baggett, & Doniger, 1999).

The approach chosen may depend on research questions or existing literature (Wilson, 2010), and relates to the research philosophy (Saunders et al., 2009). As mentioned in the last section, positivism is the research philosophy embedded in this study. According to Crowther and Lancaster (2009), positivist studies normally adopt the

deductive approach. In addition, the current study focuses on research questions related to the determinants and consequences of executive compensation. Therefore, it is committed to estimate the causal relationships between variables. This is consistent with one of the features of the deductive approach, i.e., "the need to explain the causal relationships between variables" (Saunders et al., 2009, p.127). Moreover, prior theoretical and empirical literature has provided a firm foundation for estimating the research questions in this study. Therefore, this study adopts the deductive approach in which the hypotheses are generated from well-known theories, i.e. the principal-agent theory, the tournament theory, and the managerial power theory. It then tests the validity of those theories via testing hypotheses in the context of China. According to Wilson (2010), the deductive approach is commonly associated with the quantitative methods. Therefore, this study chooses the quantitative method to test the hypotheses. To summarise, this study adopts a deductive approach in which hypotheses are developed based on existing theories and previous literature and employs a quantitative method to test those hypotheses.

4.4 Time Horizon and Data

The time horizon could be either cross-sectional or longitudinal. Specifically, the former is committed to a particular phenomenon at a particular time, and the latter focuses on observations over a given period of time (Saunders et al., 2009). One advantage of the longitudinal study is that it allows researchers to study questions involving both within and between person variance (Avey, Luthans, & Mhatre, 2008). Therefore, researchers could analyse sequences of development and change over time. Because observations included in this study contain both within and between variances in terms of executive compensation, personal characteristics, and company financial and corporate governance characteristics, the current study adopts the longitudinal time horizon.

Baker, Singleton, and Veit (2010) suggest that the data that has been previously collected by someone else for some other purposes is known as secondary data. This study involves data and statistics obtained from the professional database, company annual reports, government website and publications, and other public sources. Accordingly, this study utilises the type of secondary data. Using secondary data has both advantages and disadvantages. On one hand, the secondary data improves the feasibility of longitudinal study, saves time, and provides an unobtrusive measure, but on the other hand, researchers have no real control over the quality of the secondary

data (Saunders et al., 2009). For example, there might be some unobservable manual mistakes during the typing process of the original data. This study tries to mitigate the effects of the disadvantage of using secondary data via the following ways. First of all, it selects the data sources which have been widely used in previous literature and gained a good reputation. In addition, for any data with uncertainty, this study has double-checked other sources for confirmation.

4.5 Hypotheses Development

Hypotheses tested in this study are developed in this section. Specifically, hypotheses in relation to the determinants of executive compensation are developed based on the principal-agent theory, the tournament theory, and the managerial power theory, while the hypothesis regarding the causal effects of adopting equity-based pay on company performance is developed from the principal-agent theory.

4.5.1 Determinants of Executive Compensation: Principal-agent Perspective

The principal-agent theory argues that executive pay should be tied to firm performance in order to mitigate interest conflicts between managers and shareholders (Jensen & Meckling, 1976). In particular, cash compensation should be structured to provide big rewards for outstanding performance and meaningful penalties for poor performance (Jensen & Murphy, 2010). In China, the conflicts between shareholders and executives due to the separation of ownership and control have emerged since establishing the modern corporation system. In order to reduce those conflicts, Chinese listed companies follow developed countries in constructing compensation contracts which tie the interests of executives to those of shareholders. In addition, the market becomes more competitive through a set of market reforms. According to Holmström and Tirole (1989), the pay-performance link might be strengthened in a competitive market because this market provides more accurate information regarding company performance. The majority of empirical studies on the relation of compensation level and company performance in China support the principal-agent theory, and suggest that the level of compensation is positively tied to company performance (e.g. Kato & Long, 2006). However, cash compensation seems to be more closely tied to accounting-based performance than stock-based performance (e.g. Conyon & He, 2012). Based on the principal-agent theory together with previous empirical literature, the first hypothesis in this study is:

Hypothesis 1: Holding other controls constant, the level of executive compensation is positively related to company performance.

In addition, one of the most important roles of the board of directors is to create incentives to align an executive's best interest with that of the shareholders (Jensen & Murphy, 1990). In practice, the "*Code of Corporate Governance*" states that setting executive compensation is one of the critical responsibilities of the board of directors or its remuneration committee in Chinese listed companies (CSRC, 2001). According to the principal-agent theory, the absence of a remuneration committee will provide an opportunity for senior executives to award themselves pay rises that are not aligned with shareholder interests (Conyon & Peck, 1998). Therefore, boards without a remuneration committee are supposed to be less effective in setting executive compensation to ameliorate interest-conflicts between managers and shareholders (Conyon & He, 2011; Newman & Mozes, 1999). Consequently, the level of compensation is reversely influenced by the presence of a remuneration committee, whereas both the pay-performance link and the likelihood of receiving equity-based compensation are positively influenced by the presence of a remuneration committee. This study has been of the following three hypotheses regarding the effects of the presence of a remuneration committee on executive compensation plans:

Hypothesis 2: Holding other controls constant, the level of executive compensation is lower in companies with the remuneration committee;

Hypothesis 3: Holding other controls constant, executive compensation and company performance are more aligned in companies with the remuneration committee;

Hypothesis 4: Holding other controls constant, executives are more likely to receive equity-based compensation in companies with the remuneration committee.

4.5.2 Determinants of Executive Compensation: Tournament Perspective

Tournament theory views internal labour market and compensation schemes as sequential elimination tournaments in which managers compete against one another in a related series of tournaments (Lambert et al., 1993). In particular, the higher compensation is viewed as prize which motivates lower level hierarchy executives to compete for promotions (Leonard, 1990). However, the higher up the hierarchical level the executive moves, the less the opportunity for promotion left (Conyon & Sadler,

2001). Therefore, the level of compensation should be higher at higher hierarchical levels to compensate for the lost promotion opportunities and to keep contestants in the game (Lazear & Rosen, 1981). Consequently, the compensation level is predicted to be an increasing function of hierarchical levels. Executives in Chinese listed companies are allocated into different levels of seniority and have opportunities to be promoted to higher hierarchical levels via internal labour market contests. Prior literature also provides empirical evidence that compensation schemes in China tend to be aligned with the predictions of tournament theory. Lin et al. (2011) argue that Chinese listed companies have a pay structure which is consistent with the predictions of tournament theory, and they observe that the level of compensation increases as executives are promoted to higher hierarchical levels. Therefore, the fifth hypothesis is:

Hypothesis 5: Holding other controls constant, the level of executive compensation is an increasing function of hierarchical levels.

However, Anabtawi (2005) argues that compensation differential motivates only potential CEOs, not the victorious CEO who has won the prize, so an approach other than internal labour market contests is needed to influence CEO behaviour. Therefore, it might be desirable to use incentive compensation as a device to motivate the victorious CEOs (Anabtawi, 2005). This idea is also supported by Ekinci (2011), who argues that incentives within a corporate hierarchy are provided in various forms: explicit incentives come with the compensation package a job entails (i.e. bonus payment), whereas implicit incentives are embedded in the job itself in the form of potential future benefits (i.e. incentives provided through the possibility of promotion). Ekinci (2011) develops a dynamic tournament model and predicts that the size of bonus payments increases with job level. The model also predicts that workers are offered the compensation contract that balances their incentives provided through bonus payments and the possibility of promotions (Ekinci, 2011). Therefore, as argued by Conyon and Sadler (2001), tournament theory can also explain how incentive compensation varies across hierarchical levels. Based on the tournament theory, Conyon and Sadler (2001) indicate a positive relationship between hierarchical levels and the pay-performance sensitivity in the U.K. That is to say, compensation and company performance are more aligned as the executive moves up to higher hierarchical levels within a company.

Therefore, as there will be fewer promotion opportunities when an executive moves up to a higher hierarchical level within a company (Lazear & Rosen, 1981), more

performance-based compensation is needed to provide additional financial incentives for this executive to stay in the tournament and work best for shareholder interests. Therefore, the sixth and the seventh hypotheses are:

Hypothesis 6: Holding other controls constant, the level of executive compensation and company performance are more aligned at the higher hierarchical level;

Hypothesis 7: Holding other controls constant, executives at the higher hierarchical level are more likely to receive equity-based compensation.

4.5.3 Determinants of Executive Compensation: Managerial Power Perspective

Managerial power theory holds a view that executives may influence pay settings to extract rent for themselves through their power (Bebchuk & Fried, 2003). This may result in compensation contracts which are more favourable to executives rather than shareholder wealth maximization (Conyon & He, 2004). As suggested by Finkelstein (1992), CEOs may be paid less if their managerial power is reduced since they are not able to influence the compensation plan.

Remuneration committees have the responsibility to set compensation schemes. However, more compliant remuneration committees result in excess compensation for executives and suboptimal compensation contracts from the shareholders' perspective (Conyon, 2006). Therefore, an executive can extract rent at the expense of shareholders through influencing remuneration committee's decisions on compensation plans (Bebchuk et al., 2002). That is to say, the compensation contracts will be more favourable to executives if the remuneration committee is controlled by executives. In particular, the strength of managerial power on influencing compensation plans depends on the composition and the size of remuneration committee (Sun & Cahan, 2009).

First of all, the proportion of inside executives on a remuneration committee could be considered as an indicator of managerial power. Insider directors have the motivation to collude with CEOs and other executives to benefit themselves at the expense of shareholders' interests (Beatty & Zajac, 1994). This sort of behaviour may lead to higher compensation for executives. Therefore the inclusion of insiders on remuneration committees may indicate the ineffectiveness of a board in protecting shareholder interests (Singh & Harianto, 1989). In particular, a higher proportion of insiders on the

remuneration committee will result in higher managerial power to influence compensation plans.

Singh and Harianto (1989) suggest that a higher proportion of company executives on the remuneration committee results in a larger size of the golden parachute contract and a greater number of executives would be covered by the golden parachute contract. Newman and Mozes (1999) also observe that the pay-performance link is more favourable for the CEO when insiders are on the remuneration committee. Anderson and Bizjak (2003) indicate that the level of compensation is more sensitive to company performance as the remuneration committee independence increases. Based on the managerial power theory and prior studies, one can predict that:

Hypothesis 8: Holding other controls constant, the level of executive compensation is positively influenced by the proportion of insiders on the remuneration committee;

Hypothesis 9: Holding other controls constant, the level of executive compensation and company performance are less aligned when the proportion of insiders on the remuneration committee is higher;

Hypothesis 10: Holding other controls constant, executives are less likely to receive equity-based compensation when the proportion of insiders on the remuneration committee is higher.

In terms of the remuneration committee size, it has been suggested that smaller remuneration committees are more easily influenced by executives (e.g. Sun & Cahan, 2009). In addition, Bushman, Chen, Engel, and Smith (2004) argue that smaller boards may have fewer advisors and monitors of management. Song and Windram (2004) also point out that a larger board might be more effective as the company has greater resources to appoint directors and committee members with relevant and complementary expertise and skills. Accordingly, the monitoring role of smaller remuneration committees might be weaker due to the lack of enough professionals to monitor. Therefore, one can predict that it is easier for executives to influence smaller remuneration committees to get favourable compensation packages. For instance, Sun and Cahan (2009) empirically indicate that the relation of the level of CEO cash compensation and company accounting-based performance is positively affected by the remuneration committee size. Consequently, this study has the following hypotheses:

Hypothesis 11: Holding other controls constant, the level of executive compensation is negatively influenced by the size of remuneration committee;

Hypothesis 12: Holding other controls constant, the level of executive compensation and company performance are less aligned when the remuneration committee is smaller;

Hypothesis 13: Holding other controls constant, executives are less likely to receive equity-based compensation when the remuneration committee is smaller.

4.5.4 Equity-based Compensation and Company Performance: Principal-agent Perspective

As mentioned earlier, the principal-agent theory views incentive compensation as an important mechanism to mitigate agency problems as it aligns executives' interests with those of shareholders (Jensen & Meckling, 1976). Equity-based compensation should be included in an executive's pay portfolio to contribute to the alleviation of agency problems (Core & Guay, 1999; Murphy, 1999), because equity incentives provide the most powerful link between shareholder wealth and executive wealth (Jensen & Murphy, 2010).

As executives will experience a direct and powerful 'feedback effect' from changes in market value when they hold a meaningful percentage of total equities in their companies (Jensen & Murphy, 2010), equity-based compensation provides monetary incentives for executives to work hard at maximising the company value. This important role of equity incentives in boosting company performance has been empirically demonstrated by prior literature. For instance, Mehran (1995) indicates that firms in which the percentage of executive equity-based compensation is greater tend to produce higher accounting returns. Lian et al. (2011) empirically indicate that the adoption of equity incentives positively influence the accounting-based performance of Chinese listed companies.

In summary, the principal-agent theory and prior empirical literature suggest that a fundamental reason for the use of equity incentives is to link changes in executive wealth directly to changes in a company's performance, thereby offering executives with incentives to work hard at maximising shareholder wealth (Core et al., 2003). Therefore, if equity-based compensation provides such financial incentives for executives, the adoption of equity-based compensation should result in performance

improvements which are favourable for shareholders. Consequently, the last hypothesis is as follows:

Hypothesis 14: Holding other controls constant, adopting equity-based compensation delivers better future financial performance of the firm.

4.6 Regression Models

4.6.1 Determinants of Compensation Level

Hypothesis 1 predicts that the level of executive compensation positively relates to company performance. Following equation 3.2 in Chapter 3, the following model is applied to test hypothesis 1:

$$Log(cash)_{i,j,t} = \alpha + \beta_1 Performance_{j,t} + \gamma X + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \quad (4.1)$$

Where, i represents an individual executive, j means a firm, t denotes a year. The dependent variable $Log(cash)_{i,j,t}$ is the natural logarithm of cash compensation for executive i in firm j in the fiscal year t. To be specific, the cash compensation is the sum of basic salary, bonus and stipends. The term $Performance_{j,t}$ means performance of firm j in the fiscal year t. In particular, the performance is measured in two ways. On one hand, an accounting-based performance is included. This is measured by return on assets (ROA), equal to net profits divided by the book value of total assets (Conyon & He, 2011). On the other hand, a market-based performance, defined as the annualized stock return derived using data of monthly return (Conyon & He, 2012), is used as an alternative measure. X denotes a set of control variables including attributes of individual executives, company economic characteristics, and corporate governance variables. The term υ_i means the unobserved time-invariant executive fixed effects, λ_j denotes firm fixed effects, and δ_t represents year effects. Finally, α is the constant term, and ε is the error term.

Hypothesis 2 predicts that the presence of a remuneration committee has a negative effect on compensation level. This is tested using the model as follows:

$$Log(cash)_{i,j,t} = \alpha + \beta_1 Committee\ Dummy_{j,t-1} + \gamma C + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t}$$

(4.2)

Where, the term $Committee\ Dummy_{j,t-1}$ is a dummy variable equal to one if firm *j* has adopted a remuneration committee in the fiscal year *t-1*. *C* denotes a set of control variables including attributes of individual executives, company financial performance and other economic characteristics, and corporate governance variables.

Hypothesis 5 predicts that compensation level is an increasing function of hierarchical level. This is tested using the following regression model:

$$Log(cash)_{i,j,t} = \alpha + \beta_1 Hierarchy1_{i,j,t} + \beta_2 Hierarchy2_{i,j,t} + \gamma C + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t}$$

(4.3)

Where, $Hierarchy1_{i,t}$ is a dummy variable which is equal to one if executive *i* in firm *j* is at the highest hierarchical level in the fiscal year *t*. $Hierarchy2_{i,j,t}$ is a dummy variable which is equal to one if executive *i* in firm *j* is at the second highest hierarchical level in the fiscal year *t*. Consistent with equation 4.2, *C* denotes a set of control variables including attributes of individual executives, company financial performance and other economic characteristics, and corporate governance variables.

Hypothesis 8 and 11 predict the positive impacts of managerial power on the level of executive compensation. Specifically, the managerial power is measured by the proportion of insiders on remuneration committee and the size of remuneration committee. The following regression model is employed to test those hypotheses:

$$Log(cash)_{i,j,t} = \alpha + \beta_1 Committee\ Insider_{j,t-1} + \beta_2 Committee\ Size_{j,t-1} + \gamma C + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t}$$

(4.4)

Where, $Committee\ Insider_{j,t-1}$ represents the proportion of insiders on a remuneration committee for firm *j* in the fiscal year *t-1*. $Committee\ Size_{j,t-1}$ denotes the size of a remuneration committee for firm *j* in the fiscal year *t-1*. *C* denotes a set of control variables including attributes of individual executives, company financial performance and other economic characteristics, and corporate governance variables.

4.6.2 Determinants of Pay-performance Link

Hypothesis 3 predicts that the compensation and company performance are more aligned at firms with the remuneration committee. This hypothesis is tested using the following regression model:

$$\begin{aligned} Log(cash)_{i,t} = {} & \alpha + \beta_1 Performance_{j,t} + \beta_2 Committee\ Dummy_{j,t-1} \\ & + \beta_3 Performance_{j,t} * Committee\ Dummy_{j,t-1} \\ & + \gamma X + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \end{aligned} \quad (4.5)$$

Where, as has been noted the term $Performance_{j,t}$ means the performance of firm *j* in the fiscal year *t*. $Committee\ Dummy_{j,t-1}$ is a dummy variable which is equal to one if firm *j* has adopted a remuneration committee in the fiscal year *t-1*. The variable $Performance_{j,t} * Committee\ Dummy_{j,t-1}$ is interaction term, defined as company performance times the dummy variable of the presence of a remuneration committee.

Hypothesis 6 predicts that executive compensation and company performance are more aligned at a higher hierarchical level. This hypothesis is tested via the following regression model:

$$\begin{aligned} Log(cash)_{i,j,t} = {} & \alpha + \beta_1 Performance_{j,t} + \beta_2 Hierarchy1_{i,j,t} + \beta_3 Hierarchy2_{i,j,t} \\ & + \beta_4 Performance_{j,t} * Hierachy1_{i,j,t} \\ & + \beta_5 Performance_{j,t} * Hierachy2_{i,j,t} \\ & + \gamma X + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \end{aligned} \quad (4.6)$$

Where, both $Performance_{j,t} * Hierarchy1_{i,t}$ and $Performance_{j,t} * Hierarchy2_{i,t}$ are interaction terms.

Hypotheses 9 and 12 relate to the moderation effect of the managerial power on pay-performance link. Specifically, they predict that executive pay and company performance are less aligned when the managerial power is higher. To test those hypotheses, the following regression equation is applied:

$$Log(cash)_{i,t} = \alpha + \beta_1 Performance_{j,t} + \beta_2 Committee\ Insider_{j,t-1} + \beta_3 Committee\ Size_{j,t-1} + \beta_4 Performance_{j,t} * Committee\ Insider_{j,t-1} + \beta_5 Performance_{j,t} * Committee\ Size_{j,t-1} + \gamma X + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \quad (4.7)$$

Where, $Performance_{j,t}$ is interacted with $Committee\ Insider_{j,t-1}$ and $Committee\ Size_{j,t-1}$, respectively.

4.6.3 Determinants of the Likelihood of Receiving of Equity-based Compensation

Hypothesis 4 predicts that executives are more likely to receive equity-based compensation in companies with a remuneration committee. The following logit regression model is applied to test hypothesis 4:

$$Equity\_based\ Pay_{i,t} = \alpha + \beta_1 Committee\ Dummy_{j,t-1} + \gamma C + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \quad (4.8)$$

Where, the dependent variable $Equity\_based\ Pay_{i,j,t}$ is a dummy variable which is equal to one if executive *i* in company *j* has been granted equity_based compensation in the fiscal year *t*. Has been noted, the term $Committee\ Dummy_{j,t-1}$ is a dummy variable which is equal to one if firm *j* has adopted a remuneration committee in the fiscal year *t-1*. *C* denotes a set of control variables including attributes of individual executives, company financial performance and other economic characteristics, and corporate governance variables.

According to hypothesis 7, executives at a higher position hierarchy are more likely to receive equity-based compensation. This hypothesis is tested using the logit regression model as follows:

$$Equity\_based\ Pay_{i,t} = \alpha + \beta_1 Hierarchy1_{i,t} + \beta_2 Hierarchy2_{i,t} + \gamma C + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \quad (4.9)$$

Where, $Hierarchy1_{i,t}$ is a dummy variable which is equal to one if executive *i* in firm *j* is at the highest hierarchical level in the fiscal year *t*. $Hierarchy2_{i,j,t}$ is a dummy variable which is equal to one if executive *i* in firm *j* is at the second highest hierarchical level in the fiscal year *t*. Consistent with equation 4.8, *C* denotes a set of control variables including attributes of individual executives, company financial performance and other economic characteristics, and corporate governance variables.

Hypothesis 10 and 13 predict that the propensity of receiving equity-based compensation is lower when managerial power is higher. The following logit regression model is employed to test those hypotheses:

$$Equity\_based\ Pay_{i,t} = \alpha + \beta_1 Committee\ Insider_{j,t} + \beta_2 Committee\ Size_{j,t} + \gamma C + \upsilon_i + \lambda_j + \delta_t + \varepsilon_{i,j,t} \quad (4.10)$$

Where, as has been noted, $Committee\ Insider_{j,t-1}$ represents the proportion of insiders on a remuneration committee for firm *j* in the fiscal year *t-1*. $Committee\ Size_{j,t-1}$ denotes the size of a remuneration committee for firm *j* in the fiscal year *t-1*. As mentioned, *C* denotes a set of control variables including attributes of individual executives, company financial performance and other economic characteristics, and corporate governance variables.

4.6.4 The Causal Effect of Adopting Equity-based Compensation on Company Performance

Hypothesis 14 predicts that adopting equity-based compensation delivers better company performance. The following difference-in-difference (DID) regression model is employed to test the hypothesis 14:

$$Performance_{j,t} = \alpha + \beta_1 Treated_j + \beta_2 After_{j,t} + \beta_3 Treated_j * After_{j,t} + \gamma V + \lambda_j + \delta_t + \varepsilon_{j,t} \quad (4.11)$$

Where, $Treated_j$ is a dummy variable equal to one if company *j* belongs to the treatment group (i.e. group with companies which have adopted equity-based compensation during the sample period). $After_{j,t}$ is a dummy variable equal to one if firm *j* in the post-

treatment year (i.e. one year after adopting equity-based compensation). $Treated_j*After_{j,t}$ is the interaction term; *V*includes a set of firm level control variables.

In this section, estimating strategies for the models presented above are discussed. In particular, estimators of the determinant of compensation level and pay-performance link, the determinant of the likelihood of receiving equity-based compensation, and the effect of adopting equity-based compensation on company performance are discussed, respectively.

4.7 Estimating Strategies

4.7.1 Key Assumptions of the Linear Regression

Checking and discussing the assumptions are important because, when estimation methods do not meet their assumptions, the significance and magnitude of coefficients might be over- or under-estimated (Osborne & Water, 2002). In this study, the multiple regression analysis is employed to test the hypotheses. Therefore, key assumptions of the multiple regression analysis, including linearity, normality, independence of the errors, and homoscedasticity, should be satisfied. Those five assumptions are discussed below.

First of all, the multiple regression analysis requires a linear relationship between the dependent variable and independent variable. When the linearity assumption is not met, the true relation between the dependent variable and predictor might be under-estimated (Osborne & Water, 2002). Therefore, it is important and necessary to assess the linearity assumption. The linearity could be tested through the visual depiction of a sloping pattern. In particular, the STATA software offers the plot of residuals versus predicted values which could be used to assess the linearity assumption. According to Gujarati (2003), the transformation of variables could assist in dealing with non-linearity. For instance, the log transformation of executive compensation has been employed by a number of prior studies (e.g. Core et al., 1999; Conyon & He, 2012).

Normality is another assumption of the multiple regression analysis. Specifically, it assumes that variables are normally distributed. The non-normally distributed variables can distort relationships and significance tests (Osborne & Water, 2002). In practice, one can assess the normality via skewness and kurtosis. According to Park (2008), a normally distributed random variable should have skewness and kurtosis near to 0 and 3,

respectively. In addition, the STATA software provides a variety of approaches such as Skewness-Kurtosis test, Kolmogorov-Smirnov test and probability-probability plot (P-P plot) to assess the normality. Following prior literature, this study relies on the log-transformation to increase the normality of variables.

Thirdly, the multiple regression analysis assumes the homoscedasticity. To be specific, the homoscedasticity means that the error has the same variance for any value of the independent variable (Wooldridge, 2013). Oppositely, the phenomenon that the variance of errors varies with different values of the independent variable is called heteroscedasticity. In the econometric literature, two approaches are recommended to correct the standard errors for heteroscedasticity. First of all, transformation of variables could mitigate the issue of heteroscedasticity (Osborne & Water, 2002). In addition, the heteroscedasticity-consistent standard errors could also be employed (White, 1980; Peterson, 2009). Therefore, consistent with the above econometric literature and prior executive compensation studies (e.g. Conyon & He, 2012; Chen et al., 2011), the log transformation of executive compensation together with robust standard errors is employed to reduce the heteroscedasticity.

Finally, the assumption of independence of errors means that data does not suffer from the autocorrelation problem. As will be discussed in the next section, the panel data utilised in this study is associated with both cross-sectional dependence and time-series dependence. Consistent with Petersen (2009), in this study, standard errors are clustered by firms and year dummies are jointly applied to deal with the cross-sectional dependence and time-series dependence. To be specific, the cluster approach allows for correlations between errors in the same cluster (Wooldridge, 2013), and including year dummies is helpful to absorb year effects (Petersen, 2009).

4.7.2 Multi-collinearity Diagnosis

It is important to take the potential multi-collinearity problem in the model into account. The term multi-collinearity refers to the inter-correlation among the independent variables in a multiple regression model (Wooldridge, 2013). As the degree of collinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated (Chen, Ender, Mitchell, & Wells, 2003). This study employs two approaches to test the collinearity. First of all, it applies the Pearson Correlation matrix. To be specific, the correlation coefficients of independent variables should be less than 1. In addition, the variance

inflation factor (VIF) test is a prevalent technique to test the degree of multi-collinearity. The multi-collinearity could be diagnosed via the VIF value computed by the VIF test. In particular, the multi-collinearity problem exists when the VIF value is greater than 10 (Chen et al., 2003; Wooldridge, 2013).

4.7.3 The Fixed-effect Two-stage Least Squares Estimator

This study contributes to the compensation literature by applying the fixed-effect two-stage least square (FE-2SLS) instrumental variables (IV) estimator. One advantage of this estimator is that it accounts for endogenous explanatory variables as well as unobserved heterogeneity (Semykina & Wooldridge, 2010). In the regression, standard errors are clustered by companies, and year dummies are included. The rationale of selecting this estimator is discussed in the following section.

4.7.3.1 Panel Data: Cross-sectional Dependence and Time-series Dependence

As has been noted, the time horizon of this study is longitudinal. In other words, panel data with both the cross-sectional and time series dimensions is employed in this study. To be specific, the sample spans six years from 2006 to 2011 inclusive (time series dimension), and the observations include individual executives from a wide range of listed firms (cross-sectional dimension). Using panel data has the following advantages:

1. As panel data usually contain more degrees of freedom and more sample variability, it can improve the efficiency of econometric estimates and produce a more accurate inference of model parameters (Hsiao, 2007);

2. Using panel data allows one to control for individual heterogeneity, whereas pure time-series data or pure cross-sectional data cannot (Baltagi, 2005). In other words, panel data is helpful to control for individual-specific unobservable effects which may be correlated with other explanatory variables by combining time-series and cross-sectional data (Hausman & Taylor, 1981);

3. Finally, the additional variation generated by combining cross-sectional and time-series data will be helpful to reduce the potential multicollinearity problem if time series are modelled individually (Brook, 2008).

However, using panel data also generates some econometric issues. In particular, when using panel data, both the time-series dependence and cross-sectional dependence may exist and result in correlated residuals so that failure to plan for these effects will lead to biased standard errors (Peterson, 2009). To be specific, the time-series dependence will lead to correlated residuals across time for a given section, and the cross-sectional dependence will result in interdependent residuals across sections within a single period. It is important to deal with the existence of cross-sectional dependence and time-series

dependence because they violate the assumption of independence of the errors of regression analysis, as has been noted in the last section.

In this study, both the time-series dependence and cross-sectional dependence might be problematic. First of all, an executive may be repeatedly observed so that observations for a given executive are likely to be dependent during the sample period. This implies that standard errors may be correlated for a given executive at different points in time due to the existence of unobserved individual effects. In addition, there might be observed and unobserved correlations between different executives in a single year. In particular, the panel data involved in this study is characterised by consisting of both the individual-level and firm-level information (i.e. multi-level data), which is a natural nested grouping (i.e. individuals are grouped by company). As an individual executive may come from the same company, there are multiple observations per company-year. These observations may share observable characteristics and unobservable characteristics that would lead the regression disturbances to be correlated (Moulton, 1990). In this study, economic and corporate governance variables are lacking independence across different executives from the same company within the same year. Ignoring the clustered nature of the data will lead to underestimated standard errors and overestimated statistical significance of the coefficient (Moulton, 1990; Primo, Jacobsmeier, & Milyo, 2007).

Petersen (2009) suggests that a common approach which accounts for two dimensions (i.e. the cross-sectional dependence and the time-series dependence) is to combine clustered standard errors with dummy variables for different points in time. Primo et al., (2007) also argue that a popular method to adjust the standard errors affected by intra-cluster correlation is the clustered standard errors approach. This approach accounts for both the intra-cluster correlation and the general form of heteroskedasticity. In particular, researchers are typically encouraged to cluster statistical inferences at the level of key aggregated regressors (Moulton, 1986; Cameron & Miller, 2010). As key regressors are at the company level in our panel data set, the standard errors are clustered by companies. Therefore, this study employs the individual fixed-effect model with clustered standard errors by companies and includes year dummies, in order to deal with the cross-sectional dependence and time-series dependence.

4.7.3.2 Instrumental Variables and Two-stage Least Squares

4.7.3.2.1 Potential Endogeneity

The two-way causality between executive compensation and company performance may result in the potential endogeneity problem in this study. On one hand, executive compensation could be considered as the reward which is on the basis of company performance (performance→compensation), but on the other hand, it can be viewed as the finance incentives for executives to improve further performance (compensation→ performance). Using a sample of Chinese listed companies, Buck et al. (2008) empirically indicate that executive compensation and company performance mutually affect each other. Accordingly, prior studies on the reward effect of performance on Chinese executive compensation (performance→compensation) may provide biased estimates without taking into account the reverse motivation influence of compensation on performance (Buck et al., 2008).

4.7.3.2.2 Instrumental Variables

The instrumental variable (IV) estimation is the standard solution to alleviate endogeneity problems in the econometric textbook. However, it is challenging to select and justify instrumental variables as the appropriate instrumental variables should be correlated with the endogenous regressor but uncorrelated with the dependent, and IV methods can produce highly biased or even wrong estimates even if the instrumental variable is slightly endogenous (Larcker & Rusticus, 2010). That is to say, the instrumental variable can only affect the dependent variable through its effect on endogenous explanatory variable. In this study, the instrumental variable must be significantly correlated with firm performance but uncorrelated with 'executive compensation'. In other words, the instrumental variable z in this study should be satisfied with the following econometric requirements:

(1) z is uncorrelated with error term u, that is:

$$Cov\,(z, u) = 0; \tag{4.12}$$

(2) z is correlated with the endogenous explanatory variable x, that is:

$$Cov\,(z, x) \neq 0; \tag{4.13}$$

This study selects the relative market share and the large shareholder stock transfer announcement dummy as the instrumental variable for accounting performance (i.e. return on assets) and stock-based performance (i.e. stock return), respectively. Specifically, the large shareholder stock transfer announcement is a dummy variable equal to 1 if firm *j* makes an announcement that its large shareholder transfer stocks to other shareholders in a given fiscal year *t* and equal to 0, otherwise, while the relative market share is the ratio of a firm's market share to the sum of the market share of its three largest competitors. In fact, absolute market share and the relative market share are two different measures of market share which are commonly used in business studies. However, Szymanski, Bharadwaj, and Varadarajan (1993) suggest that the absolute market share is preferred when a specific industry is used, while the relative market share is preferred when pooled cross-section data across industries is employed. One of the important reasons is that relative market share could better capture the business' scale and bargaining effects in its industry (Buzzell & Gale, 1987). To be specific, the relative market share is calculated using equation 4.14 as follows:

$$Relative\ Market\ Share_{j,t} = \frac{MarketShare_{j,t}}{\sum_{n=1}^{3} MarketShare_{n,t}} \qquad (4.14)$$

Larcker and Rusticus (2010) argue that researchers must use economic theory to support the selection of instrumental variables. This study chooses the market share and the large shareholder stock transfer announcement dummy as the instrumental variables based on the market power theory and the efficient market hypothesis theory, respectively. First of all, the market power theory suggests that large market share creates market power advantages, and the market power enables firms to make profit through raising product prices or offering inferior products because their rivals cannot provide customers with a reasonable alternative (Jacobson, 1988). Secondly, according to the efficient market hypothesis theory (Fama, Fisher, Jensen, & Roll, 1969), if the announcement conveys vital information in an efficient market, then it is assumed that such information will be reflected by stock price movements (Hussin, Ahmed, & Ying, 2010) when the information is publicly released to the market.

However, there is little reason to think that the relative market share has a direct influence on executive compensation. The relative market share of companies will be related to the level of executive compensation only through its influence on ROA.

Similarly, there is little reason to consider that shareholding transfer announcements directly affect the level of executive compensation. Shareholding transfer announcement dummy will be associated with executive compensation only through its influence on the company stock-based performance.

Bun and Harrison (2014) suggest that when an endogenous variable is interacted with an exogenous variable, the instrumental variable of the endogenous variable ought to be interacted with the exogenous variable of the interaction term to achieve identification. This is also supported by other statisticians such as Balli and Sørensen (2013). Therefore, the instrumental variable of performance is interacted with the exogenous part of the interaction term, in order to construct the instrument for the interaction term.

4.7.3.2.3 Two-stage Least Squares

After selecting the instrumental variables, the next step is to apply an appropriate estimator. One of the most common instrumental variable estimators is the two-stage least squares (2SLS). Theoretically, in the first stage, the predicted value of firm performance is obtained from regressing firm performance on the instrumental variable *Z* and all the other independent variables, as shown by equation 4.14 below.

First stage: $$performance_{j,t} = \alpha + \beta_1 Z_{j,t} + \beta_2 controls + \varepsilon_{j,t} \quad (4.14)$$

In the second stage, the estimated value of firm performance from stage one is in place of the original firm performance so that one can estimate how executive compensation responds to the predicted value of firm performance ($\hat{performance}$) and all the other independent variables, as shown by equation 4.15 as follows.

Second Stage: $$log(cash)_{i,t} = \alpha + \beta_1 \hat{performance}_{j,t} + \beta_2 controls + \varepsilon_{i,t} \quad (4.15)$$

However, Wooldridge (2013) argues that manually performing the 2SLS will result in invalid standard errors and test statistics. Therefore, this study relies on STATA to directly perform the 2SLS estimation. In addition, the strength of the instrumental variable could be identified through the statistics obtained from the 2SLS estimation. In particular, for exactly identified models with one endogenous variable, a common rule of thumb to reject the null hypothesis that the excluded instruments are irrelevant is: the

F-statistic in the first-stage regression should be larger than 10 (Cameron & Trivedi, 2010).

4.7.3.3 Omitted Variable Bias and Remedies

The concern of an omitted variable may also result in the potential endogeneity problem. The omitted variable bias may be due to the factors which are difficult to measure and/or the unobserved factors consisting of time-constant factors and time-varying factors (Wooldridge, 2013). Graham, Li, and Qiu (2012) indicate that the majority of executive compensation variations can be explained by these time-invariant firm and managerial effects resulting from differences in corporate culture and in managers' latent traits (e.g. innate ability, personality and risk aversion) which may not be easily observed or measured, so accounting fixed effects represents an advance in modelling the determination of executive compensation.

As mentioned earlier, an important benefit of panel data is that it is able to control for individual-specific unobservable effects which may be correlated with other independent variables (Hausman & Taylor, 1981). In addition, the within-groups estimator (e.g. fixed-effect panel data method) is a good approach to control for the potential omitted variable bias resulting from unobserved time-constant factors (Hausman & Taylor, 1981; Wooldridge, 2013; Abdallah, Goergen, & O'Sullivan, 2015). Therefore, in this study, the time-constant factors which might affect executive compensation will be eliminated via the executive fixed-effect panel data method. Wooldridge (2013) also suggests that another possible solution is to try to include more control variables in the multiple regression analysis. This study selects and measures possible factors based on previous literature, in order to mitigate the omitted variable bias.

In summary, when testing models regarding the determinants of compensation level and pay-performance link, the fixed-effect two-stage least squares (FE-2SLS) instrumental variables (IV) estimator is applied to take account of endogeneity of company performance, and correlated unobserved effects. Standard errors are clustered by companies, and year dummies are included, in order to account for the cross-sectional dependence and the time-series dependence.

4.7.3.4 The Logit Regression

Following previous studies such as Tzioumis (2008) and Conyon and He (2012), this study employs the logistic regression with standard errors clustered by companies to estimate the determinants of the likelihood of receiving equity-based compensation. Similar to the estimation of the determinants of cash compensation, the independent variables related to company financial and corporate governance characteristics are lagged by one year in logistic regression. One of the reasons is that the influence of those corporate governance mechanisms on executive compensation settings might take time to take place. In addition, the logistic model includes the lagged performance measure as this study predicts that companies might be motivated by previous performance to adopt equity-based compensation, based on agency theory. Using lagged independent variables will be helpful to mitigate the potential endogenous problem.

4.7.4 The Propensity Score Matching Method

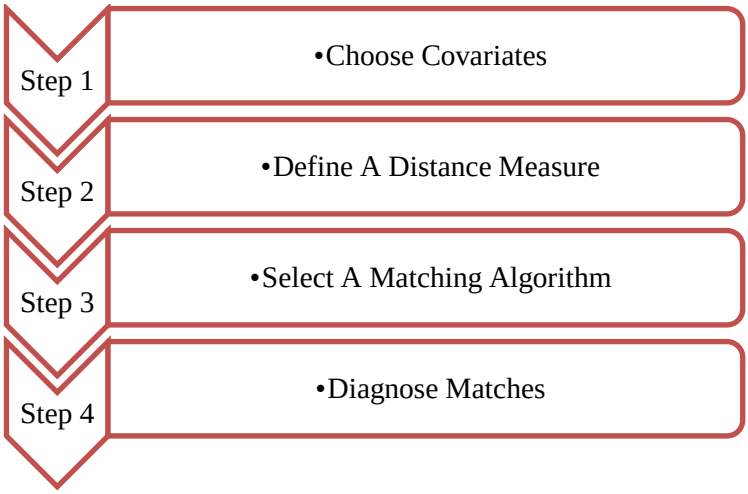
Stuart (2010) suggests that it is desirable to replicate a randomised experiment as closely as possible by obtaining treated and control groups with similar covariate distributions, when estimating causal effects using observational data. Matching attempts to mirror a randomised experiment where two groups are almost identical except that one of the groups receives a certain treatment (Rosenbaum & Rubin, 1985). Therefore, before estimating the causal effect of the adoption of equity-based compensation on company performance using the difference-in-difference (DID) regression, this study employs the propensity score matching technique to construct the treatment and matched control groups. The propensity score matching was first introduced by Rosenbaum and Rubin (1983), and has been increasing popular in different research areas such as corporate finance (e.g. Armstrong, Jagolinzer, & Larcker, 2010; Murphy & Sandino, 2010), social science (e.g. Young, 2008), and medical science (e.g. Lu, Zanutto, Hornik, & Rosenbaum, 2001).

As has been noted, the treatment group includes listed companies which have started to adopt equity-based compensation between 2006 and 2010, while elements in the matched control group are selected from companies which never adopt equity-based compensation during the same period.

4.7.4.1 Steps in Implementing Matching Methods

In general, there are four key steps in implementing matching methods (see also Stuart and Rubin, 2008), including choosing covariates used in the matching procedure, defining a distance measure, selecting a matching algorithm, and diagnosing matches. Figure 4.3 summarises these four steps in implementing matching methods.

Figure 4.3
Steps in Implementing Matching Methods



4.7.4.2 Choosing Covariates

The first step is to choose covariates used in the logistic regression model of propensity score matching. Stuart (2010) suggests that including all variables related to both treatment and outcome in the matching procedure is important (see also Rubin & Thomas, 1996). However, variables which may have been affected or modified by the treatment of interest should not be included in the matching process (Stuart, 2010; Austin, 2011). When employing the propensity score matching, the conditional probability of being a treated company (i.e. the propensity score) is assumed to be based on a set of economic and corporate governance covariates which also affect company performance. Definitions of those covariates are presented in Table 4.3 in Section 4.8.

4.7.4.3 Defining a Distance Measure

The second step is to define a distance measure in matching. The distance measure represents the similarity between two individuals (Stuart, 2010). Popular distance measures include propensity score, exact, and Mahalanobis distance. As combining exact matching with propensity score matching can result in large reductions in bias

(Stuart & Rubin, 2008), this study combines the propensity score matching with exact matching on a couple of covariates (i.e. industry and year). Specifically, matched pairs should be from the same industry in the same year and have the closest propensity score. This study does not use the Mahalanobis distance for two reasons. First of all, there are more than 10 covariates in the current study, and Rubin and Thomas (2000) suggest that propensity score matching performs better than Mahalanobis matching when more than five covariates are used. In addition, Mahalanobis matching works best with continuous variables (Stuart, 2010), but the current study includes both the continuous variable and binary variable.

A propensity score is the conditional probability of a unit being assigned to a particular treatment given a set of observed covariates, where the probability is normally estimated through a logit or probit model (Rosenbaum & Rubin, 1985). The distance between two individuals is the absolute value of the difference of propensity scores between those two individuals.

Let $D_{i,j}$ represent the distance between individual *i* and *j*, then:

$$D_{i,j} = \left| e_i - e_j \right| \tag{4.15}$$

Where e_i represents the propensity score for individual *i*, i.e. the probability of receiving the treatment *T* given the observed covariates *X*: $e_i\left(X_i\right) = \Pr(T_i = 1 \mid X_i)$; similarly, e_j is the propensity score for individual *j*: $e_j\left(X_j\right) = \Pr(T_j = 1 \mid X_j)$. In order to calculate the propensity score in the matching procedure, this study employs the following simple logit regression model:

$$treated_i = \alpha + \beta X_i + \varepsilon \tag{4.16}$$

Where $treated_i$ is a dummy indicator equal to 1 if company *i* belongs to the treatment group (i.e. the group with companies which have adopted equity-based compensation during the sample period); X_i includes those covariates, as has been noted.

4.7.4.4 Selecting a Matching Algorithm

The third step is to select a matching algorithm. This study uses the nearest neighbour matching, which is considered to be relatively unbiased and simple (Frisco, Muller, & Frank, 2007). The 1: k (k>1) nearest neighbour matching chooses multiple closest

controls for each treated individual. The question is, "How do we determine k?" Rubin and Thomas (1996) suggest that when the size of the treated group is smaller, a somewhat larger k is desirable, and the somewhat larger matching ratio can minimise differences in the sample variance of the estimated propensity score. They select 10 controls for each treated individual when the size of pre-matched control group (i.e. 7,848) is more than 80 times (i.e. 7,848/97) larger than the treated group size (i.e. 97). Their empirical results suggest that this 1:10 propensity score matching performs very well, removing almost all of the expected difference in the sample means of each matching variable (Rubin & Thomas, 1996). Table 4.1 below shows that the size of treated group in the current study is relatively smaller than that of the untreated group. Consistent with Rubin and Thomas (1996), this study constructs a 1:10 matching.

Table 4.1
Comparison of the Size of Treatment and Control Group before Matching

	2006	2007	2008	2009	2010	Total
Treated	15	2	10	4	10	41
Untreated	1,215	1,215	1,215	1,215	1,215	6,075
Total	1,230	1,217	1,225	1,219	1,225	6,116

4.7.4.5 Diagnosing Matches

The final step is to diagnose matches. Checking covariate balance is important as it diagnoses the quality of matching results obtained from a matching method (Stuart & Rubin, 2008). Covariate balance is achieved when both the treatment and control groups appear to be similar along their observable dimensions except for the treated variable (Armstrong et al., 2010). In the current study, covariate balance is achieved if both the treatment and control groups have a similar distribution of the covariate except for the treatment of interest (i.e. the adoption of equity-based compensation).

One of the important approaches of assessing the quality of matches is the standardised difference test. It is equal to the difference in means of each covariate divided by the standard deviation in the full treated group. The results of the standardised difference test are presented in Appendix A. Tables in Appendix A show that the 1:10 nearest neighbour matching perform well in reducing variance and achieving balance between the treated and control groups, and none of the covariates are significantly imbalanced (i.e. $p<0.05$, according to STATA) after matching.

4.7.5 The Difference-in-Difference Regression

The next step after propensity score matching (PSM) is to estimate the treatment effect using balanced matched samples. Matching and regression adjustment have been shown to work best in combination (e.g. Rubin, 1973; Rubin, 1979; Abadie & Imbens, 2006). In particular, as noted by Stuart and Rubin (2008), the matching method is applied to reduce large covariate bias between the treated and control groups, and the regression is employed to adjust for any small residual bias and to increase efficiency. Therefore, based on the adequately balanced matched samples, this study utilises the basic difference-in-difference (DID) regression model (as shown by Equation 4.11 in Section 4.6.4) to test the causal effect of adopting equity-based compensation on company performance. Consistent with prior studies (e.g. Becker & Hvide, 2013), the year of adopting equity-based compensation is excluded due to the potential endogeneity between the adoption of equity-based incentive and company performance.

4.8 Variables and Measurements

In this section, the description of variables is divided into two groups. Variables included in estimating the determinant of executive compensation are explained in the first group. In the second group, the variables involved in examining the performance consequence of adopting equity-based compensation are described.

4.8.1 Variables Included in the test of the Determinants of Executive Compensation

Table 4.2 describes variables included in models refer to the determinant of executive compensation. As shown in Table 4.2, the dependent variable is executive compensation, and it is measured in two ways. The first measure is the level of total cash compensation for individual executives. Secondly, it is measured by a dummy variable which is equal to one if an executive has received equity-based compensation in a given fiscal year. Key predictors include company performance, hierarchical levels, presence of a remuneration committee, proportion of insiders on the remuneration committee, and size of the remuneration committee. In particular, these predictors interact with company performance, respectively, in order to explore the moderation effects of these variables on the relation of pay and performance. Control variables include executive attributes, economic factors, and corporate governance characteristics. Finally, year dummies, industry dummies and regional dummies are included to control for year effects, cross-industry heterogeneity and cross-region variation, respectively. In the following subsections, the rationale of selecting and measuring these variables is explained.

Table 4.2
Description of Variables Included in the Test of the Determinants of Executive Compensation

Variable Name	Code	Definition
Dependent Variable: Executive Compensation		
Total Cash Compensation	Log(Cash)	Log transformation of total cash compensation for individual executives
Equity-based Pay	Equity-based Pay	Dummy variable; =1 if the executive has been granted equity-based compensation in a given fiscal year; =0 otherwise
Predictors		
Firm Performance		
Return on Asset	ROA	=Net profit / total assets
Stock Return	Stock Return	Annualized stock returns calculated using monthly stock return
Executive Position Hierarchy		
Hierarchy 1	Hierarchy1	Dummy variable; =1 if the executive is at the highest hierarchical level within a company; =0, otherwise
Hierarchy 2	Hierarchy2	Dummy variable; =1 if the executive is at the second highest hierarchical level within a company; =0, otherwise
Hierarchy 3	Hierarchy3	Dummy variable; =1 if the executive is at the third highest hierarchical level within a company; =0, otherwise
Remuneration Committee		
Presence of Remuneration Committee	Committee Dummy	Dummy variable; =1 if the company has established a remuneration committee in a given fiscal year; =0 otherwise
Proportion of Insiders on a Remuneration Committee	Committee Insider	Number of internal members/total number of members serving on the remuneration committee
Remuneration Committee Size	Committee Size	Total number of members serving on the remuneration committee

Table 4.2
Description of Variables Included in Testing the Determinants of Executive Compensation (Continued)

Variable Name	Code	Definition
Control Variables		
Individual Executive's Characteristics		
Female	Female	Dummy variable; =1 if the executive is a female; =0, otherwise
Age	Age	Age for each executive
Tenure	Tenure	Number of years at a given hierarchical level in a given fiscal year
Executive Ownership	Executive Ownership	Outstanding shares held by individual executive /Total number of shares of the company
Firm Characteristics		
Firm Size	Firm Size	Log transformation of total annual assets
Firm Age	Firm Age	Established years for the company
Volatility	Volatility	Stock return volatility, measured as the standard deviation of annualized monthly stock returns over the prior fiscal year
Leverage	Leverage	Debt /Total assets
Firm Growth Opportunity	Growth Opportunity	Market-to-book Ratio
Corporate Governance Characteristics		
Board Independence	Board Independence	Number of independent directors/ Total number of directors
Board Duality	Duality	Dummy variable; =1 if the board of directors is chaired by the company CEO; =0 otherwise
Size of the Board of Directors	Board Size	Total number of directors on the board
Supervisory Board Size	Supervisory Size	Total number supervisors
State Ownership	State Owned	Dummy variable; =1 if the state is the largest shareholder in a company; =0 otherwise
Foreign Ownership	Foreign Ownership	Foreign shares / total shares
Ownership Concentration	Ownership Concentration	Percentage of shares owned by the largest shareholder
Other Controls		
Year Dummy	Year Dummy	Dummy variable for each year during 2006-2011
Industry Dummy	Industry Dummy	Dummy variable for each industry; based on 5 industries classified by CSRC, including Manufactory, Public Service, Real Estate, Conglomerate, and Commerce
Region Dummy	Region Dummy	Based on 7 geographically-based regions in China, including North, Northeast, East, South, Northwest, Southwest, Central

4.8.1.1 Executive Compensation

The level of the executive compensation is one of the dependent variables in this study. Chinese listed companies are required to disclose the total cash compensation for individual executives after 2005. Therefore, in this study, the level of the executive compensation is measured as the individual executive's total cash compensation published in annual reports of Chinese listed companies. Such compensation is defined as the sum of salary, bonus and stipend. This is consistent with most prior literature in the context of China (e.g. Conyon & He, 2011, 2012; Chen et al., 2011). The use of cash compensation is also consistent with early literature in the context of developed countries (e.g. Main, 1991; Conyon, 1997). As mentioned before, skewed distributions can result in weak statistical relationships and heteroscedasticity (Tabachnick & Fidell, 1996). This problem could be mitigated by using log transformation of the compensation level in most compensation literature (e.g. Andreas et al., 2012; Linn & Park, 2005). Similarly, in this study, the log transformation of the cash compensation is employed.

Another dependent variable is the equity-based compensation. Normally, executives in Chinese listed companies are offered the equity-based compensation in the form of stock options, restricted stocks and stock appreciation rights. However, it is not possible for this study to measure the value of those equity incentives due to the data limitation resulting from weak compensation disclosure system in China. As Chinese listed companies are asked to report whether a given executive has been granted an equity-based incentive in a fiscal year, this study could take this opportunity to examine determinants of the likelihood of receiving the equity-based compensation for individual executives. Following prior studies (e.g. Tzioumis, 2008; Conyon & He, 2012), the equity-based compensation in this study is measured by a dummy variable equal to one if the executive has been granted equity-based compensation in a given fiscal year.

4.8.1.2 Company Performance

There are two types of company performance measures which are widely used in the literature. On one hand, accounting-based performance is considered to be the standard performance measure (Lambert & Larcker, 1987). On the other hand, some scholars argue that stock market-based return seems to be a more appropriate measure for performance because in the principal-agent relationship within modern corporations, the

shareholder is the principal who asks for returns (Murphy, 1985; Conyon & Sadler, 2001). Although a consensus has not reached as to which is the better performance measure, Mehran (1995) argues that the choice of measurement should not influence the qualitative nature of the results. In addition, using different performance proxies and comparing estimations are helpful to get a more comprehensive understanding of the relationship between pay and firm performance. Therefore, in this study, both accounting-based performance and stock-based performance are employed, consistent with previous literature (e.g. Firth, Leung, et al., 2010; Conyon & He, 2011; 2012). Specifically, the former is measured by return on assets (ROA), and the latter is measured by annualised stock return calculated using data from monthly returns.

Prior studies normally empirically compare the effects of accounting-based performance and stock-based performance on executive compensation. Conyon and He (2011) demonstrate that CEO pay in Chinese listed firms is more closely linked to accounting performance, although it is positively influenced by both accounting and stock-based performance. Firth et al., (2006) find that in contrast to SOE dominant shareholders, private dominant shareholders are more likely to link incentive pay to stock-based performance rather than accounting-based performance. Consistent with prior literature, this study compares the pay-performance link for accounting-based and stock-based performance.

4.8.1.3 Hierarchical Levels

The hierarchical level is another important predictor in this study. Job titles and roles of each executive are identified first of all. Next, on the basis of prior literature (e.g. Lambert et al., 1993; Conyon & Sadler, 2001; Lin et al., 2011) and features of organisational structure in Chinese listed companies, executives are classified into three hierarchical levels as follows:

- Level 1: Company CEO. This is the highest hierarchical level. Executives with the highest authorities are allocated in this group.
- Level 2: Divisional CEO. This is the second highest hierarchical level. It includes company vice general managers who are the president of divisions, such as Chief Finance Officer (CFO).

- Level 3: Other executives. This is the lowest hierarchical level in this study. Company secretaries and directors of subsections within a division are included in this group.

4.8.1.4 Presence of the Remuneration Committee

The remuneration committee plays an important role in compensation practices. In particular, companies with the remuneration committee might be more effective at monitoring executive compensation. Consistent with Main and Johnston (1993), Conyon and Peck (1998), Conyon and He (2011; 2012), the presence of the remuneration committee is measured as a dummy variable equal to one if a company reports an established remuneration committee in its annual report in a given fiscal year, and zero otherwise.

4.8.1.5 Proportion of Insiders on the Remuneration Committee

Williamson (1985) argues that in a firm without an independent remuneration committee, the contract between the firm and manager could be interpreted as the fact that managers write their own contracts with one hand and sign them with the other. Prior literature measures the composition of the remuneration committee in different ways. Vafeas (2003) employs a proportion of insiders sitting on the remuneration committee. Similarly, Singh and Harianto (1989) use a proportion of executives on the remuneration committee. Reversely, Conyon and Peck (1998) use a proportion of non-executives on the remuneration committee as the proxy for committee independence. Daily et al., (1998) employ both the proportion of affiliated directors and proportion of independent directors on the remuneration committee, while Newman and Mozes (1999) use a dummy variable equal to one if at least one insider is serving on the remuneration committee. Similar to Vafeas (2003), in this study, the proportion of non-independent directors sitting on the remuneration committee is employed.

4.8.1.6 Size of the Remuneration Committee

As mentioned early, prior literature has suggested that a smaller board might be more easily influenced by company executives (Sun & Cahan 2009; and Sun, Cahan, & Emanuel, 2009), and may also have insufficient advisors and experts in monitoring (Bushman et al., 2004). Similarly, one can expect that compensation decisions of the remuneration committee will be more likely to be influenced by executives if the

committee is smaller. As the board size is normally measured as total number of directors sitting on the board (Yermack, 1996; Firth et al., 2007), this study measures the size of the remuneration committee as total number of members serving on a remuneration committee, consistent with Sun and Cahan (2009) and Sun et al., (2009)

4.8.1.7 Executive Attributes

Effects of an individual executive's attributes including gender, age and tenure are controlled in this study. First of all, gender is one of the important managerial attributes which might determine executive compensation. In prior studies, empirical findings regarding compensation differences between males and females are mixed. On one hand, female executives are found to be paid less than male executives (e.g. Mohan & Ruggiero, 2007; Elkinawy & Stater, 2011). Elkinawy and Stater (2011) argue that the observed pay differences between females and males might be partly due to the male-dominated governance structures. On the other hand, there is no association between executive compensation and gender, according to literature such as Bowlin, Renner, and Rives (2003) and Bugeja, Matolcsy, and Spiropoulos (2012). Consistent with prior literature, this study employs a dummy variable to measure gender. Specifically, the dummy variable is equal to one if the executive is a female, and zero otherwise.

In addition, age is normally employed to measure experience and the potential horizon problem of executives in prior literature. In particular, executives who have a short horizon might boost their short-term compensation through improving short-term earnings performance (Dechow & Sloan, 1991). Gibbons and Murphy (1992) argue that older CEOs require more incentive compensation as their time horizons are shorter. This is supported by Garen (1994) who observes a positive effect of age on pay-performance sensitivity. However, Ryan Jr and Wiggins III (2001) observe that both cash bonuses and restricted stocks have a concave relationship with CEO age, while stock options are negatively linked to CEO age. The concave relationship is consistent with horizon problems among younger CEOs who want to build their reputations and older CEOs facing retirement, according to Ryan Jr and Wiggins III (2001). In this study, this variable is defined as the length of time that an executive has lived, and is measured in years.

Similarly, tenure is also considered as a proxy of potential horizon problems (Core & Guay, 1999). It is also viewed as a human capital of executives by prior literature (Williamson, 1985; Singh & Harianto, 1989; Guay, 1999). In particular, executives with

longer tenures are more capable of pursuing personal agendas as they are more likely to be entrenched (Ryan Jr. & Wiggins III, 2001). Furthermore, from a social influence perspective, as executives with longer job tenure have greater social influence, they are more likely to be able to influence the board of directors (Wade, O'Reilly, & Chandratat, 1990). Singh and Harianto (1989) find that the compensation level is higher if executives have a longer tenure. Core and Guay (1998) suggest that pay-performance sensitivity of a CEO is positively affected by tenure. Yermack (1995) indicates that CEOs with a shorter tenure receive more equity-based compensation. Following previous literature, tenure is defined, in this study, as the length of time that an executive has been in that position.

4.8.1.8 Company Economic Characteristics

This study caters for company characteristics including company size, age, risk, capital structure, and growth opportunity. Company size is a potentially important determinant of executive compensation. Researchers have found that there is a positive and significant relation between company size and the level of executive compensation (e.g. Murphy, 1985; Smith & Watt, 1992; Jensen & Murphy, 1990; Firth, Lohne, Ropstad, & Sjo, 1996; Firth et al., 2007). The level of executive compensation increases as company size increases because larger companies may provide more complex jobs (Firth et al., 2007), require better managers (Conyon, 1997), and have a better ability to pay higher compensation for executives (Firth et al., 2007). In addition, an executive in a larger company potentially has a greater marginal revenue product (Firth et al., 1996). Moreover, the principal-agent conflicts between shareholders and managers might increase with company size (Barclay & Smith, 1995). Finally, executives in large companies might feel less constrained in seeking more compensation, due to the potentially weaker shareholder control resulting from widely dispersed ownership (Firth et al., 1996). Following Firth et al., (2007), this study employs the log transformation of the book value of total assets in a given fiscal year.

Company age is also included as the control variable, given its influences on executive compensation as indicated in prior studies. Following prior literature such as Cordeiro, He, Conyon, and Shaw (2013), company age is measured as the number of years since the founding year.

Company risk is also potentially crucial to executive compensation. The standard principal-agent model establishes an economic trade-off between inducing the

appropriate amount of unobservable effort by the agent and minimising the amount of risk the agent is required to bear (Aggarwal & Samwick, 1999). One of the rationales of compensation's reaction to company risk is that risk-averse executives might ask for more compensation in companies which are more risky (Core et al., 1999). In addition, Aggarwal and Samwick (1999) suggest that executives in companies with more volatile stock prices will have less performance-based compensation. Firm risk is normally measured by stock return volatility in prior literature (e.g. Conyon & He, 2011; Cyert et al., 2002; Conyon, Core, & Guay, 2011). Consistent with Conyon et al. (2011), in this study, the stock return volatility is defined as the standard deviation of monthly stock returns in the last fiscal year.

Leverage captures a company's capital structure and has been indicated to have a negative relation with executive compensation (e.g. Yermack, 1995; Conyon & He, 2012). First of all, leverage might be an alternative governance mechanism to incentive pay (Harvey & Shrieves, 2001), because corporate debt may provide a mechanism for mitigating the potential principal-agent conflicts through cash-flow pay-out policies (Jensen, 1986). In addition, agency costs resulting from the interest conflicts between shareholders and creditors might also be crucial to explain the negative influence of leverage on executive compensation. John and John (1993) argue that compensation levels in a levered company might be less sensitive to firm performance, as it serves as a pre-commitment mechanism to minimise agency costs of debt. Consistent with prior studies (e.g. Firth, Leung, et al., 2010), this study defines leverage as total debts divided by total assets.

Company growth opportunity is found to positively affect executive compensation in studies such as Smith and Watts (1992), Gaver and Gaver (1995) and Conyon and He (2011). Growth opportunity increases resources under executives' control and in turn increases executives' power (Jensen, 1986). However, the difficulty for shareholders to monitor executives' control over those resources might aggravate principal-agent conflicts between shareholders and executives, so that more incentive compensation is needed in companies with a greater growth opportunity (Smith & Watts, 1992). Firth et al., (2007) argue that executives should be awarded for their effort and success in developing growth opportunities for companies. Consistent with Cordeiro et al. (2013) and Conyon and He (2012), company growth opportunity is measured as the ratio of market to book value.

4.8.1.9 Corporate Governance Characteristics

Executive compensation and monitoring by shareholders and the board of directors are viewed as complementary mechanisms to mitigate agency problems associated with the separation of ownership and control (e.g. Jensen & Meckling, 1976; Jensen, 1986; Holmstrom, 1979; Core et al., 1999). In addition, the influence of executives over compensation schemes might be alleviated by effective monitoring (e.g. Gomez-Mejia, 1989). Therefore, the effectiveness of monitoring, represented by the structure of the board and ownership, might be crucial to executive compensation.

This study controls the effects arising from the structure of board, including board independence, duality of company CEO and chairman of the board of directors, size of the board of directors, and size of the supervisory board. More independent directors on the board are expected to result in less managerial opportunism and more efficient compensation contracts because they are more effective in monitoring (Conyon & He, 2011). This monitoring is motivated by incentives of outside directors to develop their reputations in the internal and external labour markets (Fama & Jensen, 1983). Therefore, executives in companies with outsider-dominated boards may have a lower compensation level (Conyon & Peck, 1998). However, empirical findings regarding the relationship between board independence and executive compensation are mixed. Some scholars observe that compensation level decreases with the proportion of inside directors on the board (e.g. Lambert et al., 1993; Boyd, 1994; Core et al., 1999), while some scholars expose little or even no relationship between the percentage of outside directors and executive compensation (e.g. Finkelstein & Hambrick, 1989; Westphal & Zajac, 1995; Conyon & Peck, 1998). In addition, Mehran (1995) observed that companies with a higher proportion of outside directors use more equity-based compensation for their executives. Ryan and Wiggins (2004) find that the likelihood of using equity-based incentives decreases as the percentage of insiders on the board increases in the U.S., while Conyon and He (2012) do not document any significant influences of the proportion of outside directors on the propensity of receiving equity-based compensation in China. In this study, the control variable board independence is measured as the proportion of independent directors on the board of directors.

CEO duality captures the phenomenon that the positions of company CEO and chairman of the board of directors are concurrently held by one person. Jensen (1993) argues that separating the position of company CEO and board chairman is crucial to

the effectiveness of the board's monitoring. In particular, concurrently holding the position of board chairman provides CEOs extensive power over the board (Boyd, 1994). Therefore, CEO duality alleviates the effectiveness of the board's monitoring, and in turn, results in higher executive compensation (Conyon & Peck, 1998). Consistent with previous literature (e.g. Conyon & Peck, 1998; Peng, Li, Xie, & Su, 2010; Conyon & He, 2011; 2012), CEO duality is measured in this study as a dummy variable equal to one if the company CEO and chairman of the board of directors are combined.

The relationship between board size and the monitoring capacity of the board is debatable. Smaller boards might be short of advisors and experts in monitoring (Bushman et al., 2004), and more easily influenced by company executives (Sun & Cahan 2009; Sun et al., 2009). Therefore, the monitoring capability of a board is enhanced by an increase in board size. However, the benefits of having a large board might be overwhelmed when boards become too large. Singh and Harianto (1989) argue that the diversity of interests increases as the board size increases. In addition, a board which is too large may be associated with free-rider problems (Jensen, 1993), costs of slower decision-making, less-candid discussions of managerial performance, and biases against risk-taking (Yermack, 1996). Core et al., (1999) report a positive relationship between board size and the level of executive compensation, while Firth et al., (2007) observe that CEO compensation level is negatively influenced by board size. In addition, Yermack (1996) documents that CEO compensation is more sensitive to performance in companies with smaller boards. In terms of a supervisory board, Ding, Wu, Li, and Jia (2010) argue that the monitoring quality of the supervisory board is also affected by its size. Therefore, in this study, both the size of the board of directors and supervisory board size are included as control variables. Specifically, these two variables are measured as total number of directors on the board of directors and the total number of members serving on the supervisory board, respectively.

In addition to board characteristics, ownership structure also has potential impacts on executive compensation. As Chinese listed firms have unique ownership structures (Firth et al., 2007), controlling effects of the ownership structure is important for this study. First of all, Chinese listed companies are featured with large state ownership (Allen et al., 2005; Firth et al., 2006; Chen, Liu, & Li, 2010). Conyon and He (2012) argue that, in contrast to privately-owned firms, state-owned firms have a relatively poor monitoring quality. Therefore, state-owned companies need more financial

incentives for executives, in order to supplement the weak monitoring. However, as the state might pursue political objectives rather than profit maximisation (Shleifer & Vishny, 1997; Shleifer, 1998), state controlled companies are less likely to adopt executive incentives focusing on maximising firm value (Conyon & He, 2011). Consistent with Firth et al., (2007), this study includes a dummy variable which is equal to one if the state is the largest shareholder, and to zero otherwise.

Foreign ownership may also play an important role in designing executive compensation. First of all, a foreign investor might bring in international standards of executive compensation and corporate governance. As noted by Chen et al., (2010), the global compensation benchmark effects introduced by foreign investment result in the increase of executive compensation. In addition, foreign investors are more likely to pressurise companies to hire better qualified and internationally experienced executives who are able to negotiate higher levels of compensation (Firth et al., 2007). Finally, as foreign investors are normally too detached from companies, they might need more financial incentives to motivate executives to pursue profit-maximisation. Therefore, in this study, the effects of foreign ownership on executive compensation are controlled. Specifically, it is equal to the percentage of shares owned by foreign investors.

Chinese listed companies are also characterised by highly concentrated ownership. As noted by Firth et al., (2007) and Conyon and He (2011), almost all Chinese listed companies have a dominant shareholder who has potentially significant influences on executive compensation scheme. Firth et al., (2007) argue that shareholders in companies with concentrated ownership might have more incentives to secure their interests in their firms. Therefore, higher ownership concentration might result in better monitoring of shareholders on managerial actions. On the contrary, the free-rider problem arising from dispersed ownership might result in weak incentives for individual investors to monitor managerial behaviours (Berle & Means, 1932; Fama & Jensen, 1983; Goldberg & Idson, 1995). Therefore, the opportunistic behaviour of managers is expected to increase with the decrease of ownership concentration (Goldberg & Idson, 1995). Accordingly, entrenched executives can award themselves with high levels of compensation when ownership is less concentrated (Goldberg & Idson, 1995; Firth, Tam, & Tang, 1999; Cheung, Stouraitis, & Wong, 2005). Following Kato and Long (2006) and Conyon and He (2011; 2012), in this study, ownership concentration is measured by the percentage of shares owned by the largest shareholder.

4.8.1.10 Year Dummies and Industry Dummies

As mentioned earlier, a set of year dummies are included to cater for year effects. Year dummies could also capture macroeconomic shocks (Conyon & He, 2011). Following Firth et al., (2007) and Conyon and He (2011), industry dummy variables are included to allow for cross-industry variation in the demand for managerial talent. Finally, following Conyon and He (2012), regional dummies are employed to control for the cross-region heterogeneity.

4.8.2 Variables Included in Estimating the Causal Effect of Adopting Equity-based Compensation on Company Performance

Table 4.3 presents variables involved in testing the causal effect of adopting equity-based compensation on firm performance. Explanation of these variables is discussed below.

4.8.2.1 Company Performance

The dependent variable in the DID regression model is company performance. As mentioned earlier, there is no an agreement on how to measure company performance. Therefore, prior studies normally employ both the accounting-based performance and the stock market-based performance and compares estimations (e.g. Firth et al., 2006; Conyon & He, 2011, 2012). Following those studies, both types of performance measures are employed in this study. Specifically, the accounting-based performance is measured by ROA, and annual stock return is the proxy for the stock-market-based performance.

4.8.2.2 Treated Dummy, After Dummy, and the Interaction Term

A proper DID regression model commonly includes three important predictors: treated dummy, after dummy, and an interaction term treated*after. In this study, the variable treated dummy is equal to one if a company belongs to the treatment group (i.e. including companies which have started to adopt equity-based compensation between 2006 and 2010), and to zero otherwise. The variable after dummy is equal to one if it is one year after adopting equity-based compensation. The interaction term is defined as the treated dummy times the after dummy.

Table 4.3
Description of Variables Employed in Testing the Causal Effect of Adopting Equity-Based Compensation on Firm Performance

Variable Name	Code	Definition
Dependent Variable: Firm Performance		
Return on Asset	ROA	=Net profit / total assets
Stock Return	Stock Return	Annualized stock returns calculated using monthly stock return
Predictors: Adoption of Equity-based Compensation		
Treated*After	Treated*After	Interaction term; treated dummy times after dummy
Treated Dummy	Treated	Dummy variable; =1 if the company has adopted equity-based compensation during the sample period; =0 otherwise
After Dummy	After	Dummy variable; =1 if it is in the post-treatment year (i.e. one year after adopting equity-based pay)
Control Variables		
Firm Characteristics		
Firm Size	Firm Size	Log transformation of total annual assets
Firm Age	Firm Age	Established years for each company
Leverage	Leverage	Debt /Total assets
Growth Opportunity	Growth Opportunity	Market-to-book Ratio
Corporate Governance Characteristics		
Board Independence	Board Independence	Number of independent directors/ Total number of directors
Duality Dummy	Duality	Dummy variable; =1 if CEO and chairman of the board of directors are combined; =0 otherwise
Supervisory Board Size	Supervisory Board	Calculated by taking the natural logarithm of total number supervisors
State Owned Dummy	State Owned	Dummy variable; =1 if the state is the largest shareholder; =0 other wise
Ownership Concentration	Ownership Concentration	The percentage ownership of the largest shareholder
Executive Ownership	Executive Ownership	Sum of executive shares divided by total shares of the company
Year Dummy	Year Dummy	Dummy variable for each year during the period of 2006-2011
Industry Dummy	Industry Dummy	Dummy variable for each industry; based on 5 industries classified by CSRC, including Manufactory, Public Service, Real Estate, Conglomerate, and Commerce

4.8.2.3 Company Characteristics

One of the company characteristics controlled in the DID regression is company size. Larger companies might be characterized with diverse capabilities and advantages to exploit economies of scale (Majumdar, 1997) which may in turn generate better performance (Penrose, 1959). Moreover, larger companies are more likely to provide trainings to improve individual performance of non-owner managers (Westhead &

Storey, 1996). From the corporate governance perspective, larger firms might be associated with better corporate governance, and in turn, lead to better financial performance. For instance, Carter, Simkins, and Simpson (2003) find that the increase of company size is associated with the increase of board diversity, and board diversity results in improved financial performance. Following previous literature (e.g. Firth et al., 2007), in this study, company size is measure by the log transformation of the book value of total assets in a given fiscal year. Company age is also included as a control variable. As noted by Hannan (1998), the ability of a company to survive has a close relationship with its age. As mentioned before, company age is measured as the number of years since the founding year.

Effects of leverage are also controlled in the DID regression. Prior studies have not reached an agreement on the influence of leverage on company performance. On one hand, it has been suggested that higher leverage leads to better company performance. Jensen (1986) argues that interest payments in firms with higher debts motivate managers to invest in more effective projects with higher return. In addition, the interest-conflicts between shareholders and debtholders (Jensen & Meckling, 1976) may lead to underinvestment which do not benefit company performance (Myers, 1977). Following prior literature (e.g. Lemmon & Lins, 2003; Firth, Leung, et al., 2010), in this study, leverage is measured as the ratio of debt to assets.

4.8.2.4 Corporate Governance Characteristics

Board independence is included as a control variable in the DID regression. Although the board will be more watchful if the proportion of independent directors on the board of directors is larger (Hermalin & Weisbach, 1988), there is little empirical support for the positive influence of the board independence on company performance (e.g. Mehran, 1995; Bhagat & Black, 2001). In this study, board independence is defined as the proportion of independent directors serving on the board of directors.

The influence of CEO duality on company performance is controversial. Some scholars support that separating the positon of company CEO and chairman of the board of directors will reduce agency costs and improve firm performance (Rechner & Dalton, 1991; Dayton, 1984), while some researchers argue that CEO duality can improve company performance as it provides the CEO with full authority and responsibility over the company (Finkelstein & D'Aveni, 1994), mitigates the potential conflicts (Galbraith, 1977), and accelerates the effective decision making (Finkelstein & D'Aveni, 1994). In

this study, duality is measured as a dummy variable which is equal to one if the position of company CEO and board chairman are combined.

The relation of board size and company performance is fairly clear (Hermalin & Weisbach, 2003). Specifically, it has been found that company performance decreases as board size increases (e.g. Yermack, 1996). The size of the board of directors and the supervisory board size are both included as control variables. Specifically, the former is defined as total number of directors on the board of directors, and the latter is measured as total number of members serving on the supervisory board.

As mentioned early, Chinese listed companies are featured with large state ownership (Firth et al., 2006) and concentrated ownership (Conyon & He, 2011). In the DID regression, state ownership is measured as a dummy variable which is equal to one if state is the dominant shareholder, and to zero otherwise. Ownership concentration is defined as the sum of the squares of the shareholdings of each top 10 largest shareholders (i.e. Herfindahl_10). Finally, Yermack (1996) indicates that company performance has a significantly positive relation with executive ownership. In the DID estimation, executive ownership is defined as executive shares divided by total shares in the company.

4.8.2.5 Year and Industry Dummies

Like the FE-2SLS estimation, year dummies are also included in the DID regression, in order to account for year effects, as well as macroeconomic shocks (Conyon & He, 2011). Industry dummies are included to allow for cross-industry variation.

4.9 Data Source and Sample Selection

Data about executive compensation, managerial attributes, firm economic variables and corporate governance characteristics including board and ownership structure are obtained from the China Stock Market and Accounting Research Database (CSMAR) provided by Shenzhen GTA Information Technology Company. CSMAR is the most complete database which covers almost all listed companies in China and has been widely used in prior literature (e.g. Conyon & He, 2012; Chen et al., 2011). In addition, the remuneration committee data, including the presence of the remuneration committee and total number of members serving on the remuneration committee, is manually

collected from company annual reports[10] and announcements[11]. Finally, information about whether a remuneration committee member is an insider is manually collected from annual reports and announcements. This information is used for calculating the proportion of insiders on the remuneration committee.

In terms of samples included in estimations, two separate samples are selected to estimate determinants of executive compensation, and to test the causal effects of adopting equity-based compensation on company performance.

4.9.1 Samples Included in Testing the Determinants of Executive Compensation

In terms of samples for estimating determinants of executive compensation, this study chooses sample period 2006-2011 to reduce the sample selection biases, since Chinese listed companies are not required to disclose compensation for individual executives until the end of 2005. Between 2001 and 2005, the CSRC required all public companies to report the aggregated sum of total compensation for the three highest-paid executives and board members (Conyon & He, 2012).

Executives have to satisfy the following criteria, in order to be included in the sample. First of all, executives should not be from companies in the financial sector as financial institutions have different financial and governance characteristics. In addition, executives have to be in companies which have been listed on either Shanghai or Shenzhen stock exchange for at least two years before the end of 2006. One of the reasons for imposing this condition is that the regressions use one year lagged value of economic and corporate governance characteristics. In addition, this condition helps to ensure company economic factors, corporate governance characteristics, and executive compensation will not be affected by a new listing. Moreover, executives should come from companies which have data over the full sample period, in order to keep balanced and consistent company data. Finally, executives should have been in the current company for no less than two years, due to the use of one year lagged value of company economic and corporate governance characteristics. After deleting observations with missed variables, the final sample includes 14,919 executive-level observations containing 2,626 executives from 979 companies over the period from 2006 to 2011.

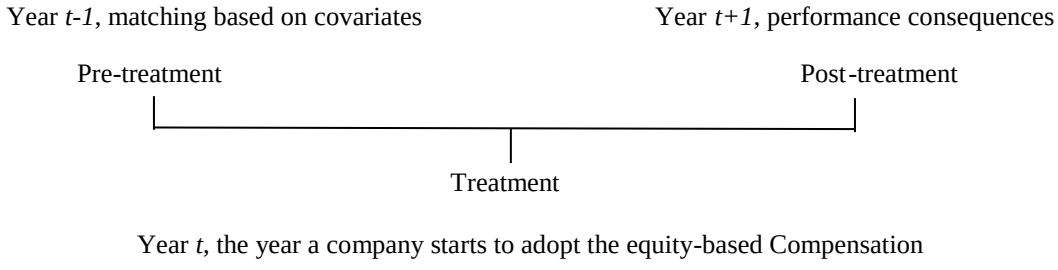
[10] Annual reports are downloaded from http://www.nbdqw.com/.
[11] Announcements are published on http://www.cninfo.com.cn/, an official website for Chinese listed firms to publish their announcements.

Only observations from companies in which the remuneration committee has been established are included in the sample, when testing the influences of the proportion of insiders on the remuneration committee and the size of the remuneration committee on executive compensation plans. This sample includes 12,790 executive-level observations consisting of 2,577 executives from 966 companies during the period from 2006 to 2011.

4.9.2 Samples Included in Testing the Causal Effect of Adopting Equity-based Compensation on Company Performance

This study uses data on the adoption of equity-based compensation between 2006 and 2010. Companies are divided into two groups in this study: a treatment group including companies which have started to adopt equity-based compensation between 2006 and 2010, and a control group including companies which have never adopted equity-based compensation during the same period. Each company in the treatment group is matched with 10 companies from the control group, one year before adopting equity-based compensation. For instance, if a company firstly starts to implement equity-based compensation in year *t*, its matched controls are selected based on covariates in year *t-1*. Therefore, data regarding covariates (e.g. economic factors; corporate governance factors) in the PSM matching procedure covers the period from 2005 to 2009. In addition, performance data from one year after adopting equity-based compensation is employed, in order to estimate whether adopting equity-based compensation delivers better future performance. Therefore, the performance data spans from 2007 and 2011. The data timeline is described in Figure 4.4.

Figure 4.4
Data Timeline



Companies have to meet the following criteria in order to have an opportunity to be included in the final sample. First of all, companies should not be in the financial sector as financial institutions may have different economic and corporate governance characteristics. Secondly, companies have to be listed on either Shanghai or Shenzhen

stock exchange at least two years before the end of 2006. One of the reasons for imposing this condition is the use of one year lagged values of economic and corporate governance characteristics in the PSM procedure. In addition, this condition helps to ensure economic factors, corporate governance characteristics and executive compensation plans will not be affected by a new listing. After dropping firms which do not meet the above criteria, the PSM method produces a final sample consisting of one treatment group and a matched control group covering 391 companies during the sample period. Specifically, the treatment group includes 41 companies, while the matched control group[12] involves 350 companies.

4.10 Conclusion

In conclusion, the research philosophy of this study is the positivism epistemology with the objectivism ontological position, and the research paradigm in this study attaches to functionalist. In addition, this study relies on the deductive research approach as it develops hypotheses based on existing theories and previous literature in the fields of executive compensation. In order to test those hypotheses, panel data are collected from the secondary source (i.e. database, annual reports, announcements), and the mono quantitative method is employed.

One methodological contribution of this study is that it employs the fixed-effect two-stage least squares (FE-2SLS) instrumental variables (IV) estimator, when testing models regarding the determinant of compensation level and pay-performance link. An advantage of this method is that it accounts for endogeneity of company performance, as well as correlated unobserved heterogeneity (Semykina & Wooldridge, 2010). In addition, standard errors are clustered by companies, and year dummies are included, in order to account for the cross-sectional dependence and the time-series dependence. In terms of estimations regarding the determinants of the likelihood of receiving equity-based compensation, this study employs logit models with year dummies and standard errors clustered by companies.

Another methodological contribution in this study is that, the propensity score matching (PSM) method is combined with the difference-in-difference (DID) estimation, in order to test the causal effect of adopting equity-based compensation on company

[12] In order to reduce matching bias, this study employs the propensity score matching using the nearest neighbour matching algorithm without replacement. Therefore, one control firm can be matched to different treatment firms.

performance. Specifically, the PSM method matches companies in the treated group with companies in the control group. The treated group consists of companies which have started to adopt equity-based compensation during the period from 2006 to 2010, and the control group includes companies which have never adopted equity-based compensation during the same period. Based on the matched sample, the causal effect is estimated via the DID regression.

The final sample includes 14,919 executive-level observations containing 2,626 executives from 979 firms over the period from 2006 to 2011, when testing the influence of company performance, the presence of the remuneration committee, and hierarchical levels on compensation plans. The sample size is reduced when testing the influence of proportion of insiders on the remuneration committee and size of the remuneration committee on compensation plans, because only observations from companies with the remuneration committee are included. This sample includes 12,790 individual-level observations containing 2,577 executives from 966 companies during the period from 2006 to 2011. Finally, there are 391 company-level observations consisting of 41 companies from the treated group and 350 companies from the control group, when estimating the causal effect of adopting equity-based compensation on company performance. Having explained models, estimators and samples in this study, related empirical findings will then be presented and discussed in the next four chapters.

Chapter 5: Compensation Level and Company Performance-Empirical Results

"Well, I-- I-- I feel fine with people making a lot of money for doing a great job. I mean, you know, the people in your field that do a great job make a lot of money".

Warren Buffett, American business magnate, investor and philanthropist, 2007[13]

5.1 Introduction

The research hypotheses and research methodology to test those hypotheses have been described in the previous chapter. This chapter moves on to the data analysis and empirical findings. Specifically, it presents empirical results for the first research question: has executive compensation been positively linked to firm performance in Chinese listed companies, as predicted by the principal-agent theory?

The remainder of this chapter is organized as follows. Section 5.2 presents the descriptive statistics for executive compensation, company performance, executive attributes, firm attributes and economic characteristics, and corporate governance characteristics during the sample period together with the correlation matrix for key variables. Empirical evidence of pay-performance relation obtained from the normal OLS estimation, the fixed-effect model and the two-stage squares approach are compared in section 5.3. This chapter ends up with section 5.4, the conclusion section.

5.2 Descriptive Statistics and Correlation Matrix

This section aims to provide the fundamental numerical information about the sample and variables used in estimating the pay-performance relation. Specifically, the descriptive statistics of executive compensation, managerial attributes, firm attributes and economic characteristics, as well as corporate governance characteristics are presented in this section.

Table 5.1 quantitatively describes the data pattern for executive cash compensation, equity-based compensation, executive share ownership, executive age, tenure and

[13] Source: Warren Buffett and NBC's Tom Brokaw: The Complete Interview. Available at: http://www.cnbc.com/id/21553857/site/14081545

gender. In particular, the central tendency and dispersion are described by mean and standard deviation, respectively. As shown in table 5.1, the mean value of executive annual cash compensation increases year by year during the period 2006-2011. The average executive cash compensation dramatically increases from 233,108 Yuan in 2006 to 324,090 Yuan in 2007, about 39 percent growth rate. The growth in pay is relatively slower between 2007 and 2009. Specifically, the average cash compensation is 349,513 Yuan and 388,427 Yuan in 2008 and 2009, respectively. The average level of executive compensation continues going up after 2009, and reaches to 471,714 Yuan in 2010. By the end of 2011, mean value of cash compensation for executives has increased to 526,577, more than two times the average compensation in 2006.

However, Chen et al. (2011) argue that in spite of the dramatic increase, the level of executive compensation in China is still much lower than that in developed countries. For instance, a report provided by Davis and Mishel (2014) from the Economic Policy Institute shows that average compensation for CEOs in America is around 12,667,000 dollars (approximately 69,705,780 Yuan), and a survey conducted in 2014 by MM&K limited, a leading independent consultancy, shows that in 2011, average compensation awarded for CEOs in the U.K. is 4,770,000 pounds (around 46,602,900 Yuan) (MM&K, 2014).

Table 5.1
Descriptive Statistics:
Executive Compensation, Share Ownership, and Managerial Attributes

Variable	Number of Observations	Year	Mean	Standard Deviation	Min.	Max.
Cash Compensation (000s Yuan)	2151	2006	233.108	244.350	11.390	5,845.000
	2603	2007	324.090	377.299	17.618	7,105.300
	2513	2008	349.513	352.829	22.936	6,846.400
	2527	2009	388.427	371.365	16.600	5,200.000
	2556	2010	471.714	451.553	24.000	6,800.000
	2569	2011	526.577	540.050	27.610	9,577.400
Total	14919		386.312	414.491	11.390	9,577.400
Equity-based Pay (Dummy)	2151	2006	0.036	0.186	0	1
	2603	2007	0.037	0.189	0	1
	2513	2008	0.047	0.212	0	1
	2527	2009	0.057	0.232	0	1
	2556	2010	0.058	0.233	0	1
	2569	2011	0.066	0.248	0	1
Total	14919		0.050	0.219	0	1
Share Ownership (%)	2151	2006	0.100	1.000	0.000	24.700
	2603	2007	0.100	1.000	0.000	24.700
	2513	2008	0.100	1.000	0.000	24.700
	2527	2009	0.100	1.000	0.000	24.700
	2556	2010	0.100	1.000	0.000	29.700
	2569	2011	0.100	0.900	0.000	23.900
Total	14919		0.100	1.000	0.000	29.700
Age (Years)	2151	2006	43.718	5.866	27	69
	2603	2007	44.393	5.862	28	70
	2513	2008	45.413	5.888	29	71
	2527	2009	46.486	5.863	30	72
	2556	2010	47.418	5.865	31	73
	2569	2011	48.452	5.861	32	74
Total	14919		46.039	6.090	27	74
Tenure (Years)	2151	2006	5.257	2.173	2.003	17.175
	2603	2007	5.671	2.409	2.003	18.175
	2513	2008	6.648	2.432	2.003	19.178
	2527	2009	7.435	2.601	2.000	20.178
	2556	2010	8.209	2.793	2.014	21.178
	2569	2011	9.037	2.949	2.000	19.014
Total	14919		7.089	2.902	2.000	21.178
Female (Dummy)	2151	2006	0.124	0.329	0	1
	2603	2007	0.126	0.332	0	1
	2513	2008	0.125	0.330	0	1
	2527	2009	0.126	0.332	0	1
	2556	2010	0.127	0.333	0	1
	2569	2011	0.125	0.331	0	1
Total	14919		0.125	0.331	0	1

The central tendency of executive cash compensation is more vividly described in figure 5.1. Both the median and mean of executive cash compensation show a rising tendency in figure 5.1. In addition, as the mean is always larger than the median, the distribution

of executive cash compensation has a positive skew. Therefore, this study takes logarithm transformation for the independent variable, executive cash compensation, in order to satisfy the OLS assumption of normal distribution. It is worth noting that similar pattern found even after adjusting for inflation.

Figure 5.1
Executive Cash Compensation, 2006-2011

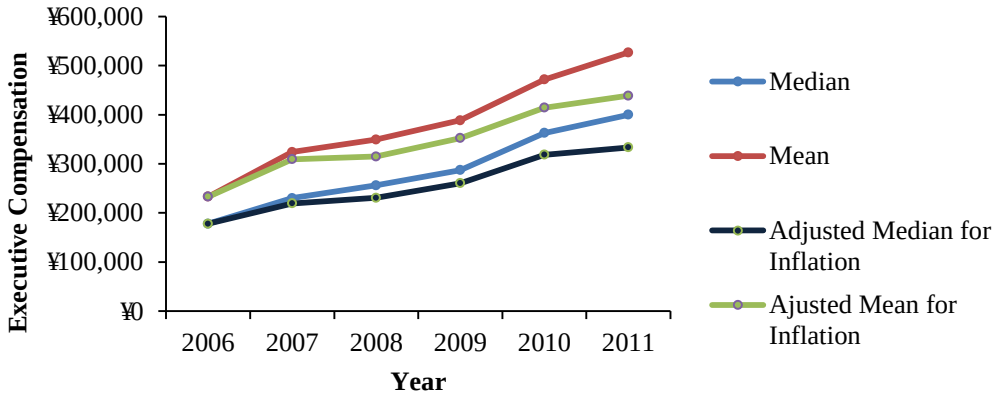
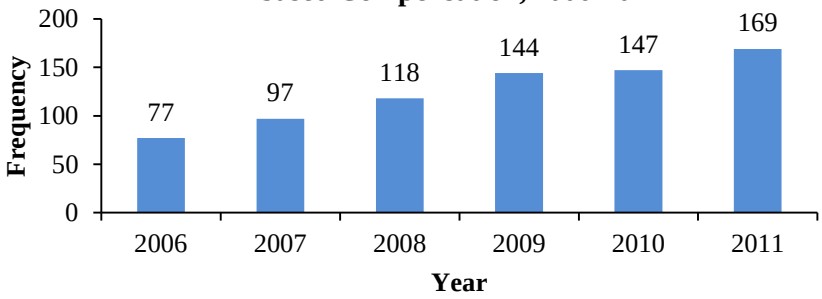


Figure 5.2
Frequency Distribution of Executives with Equity-based Compensation, 2006-2011



The proportion of executives who have been granted equity-based compensation is very low, although it experiences annual increases during the period 2006-2011. As shown in table 5.1 and figure 5.2, only 77 executives, about 3.6 percent of total executives, have been granted equity-based compensation in 2006, and the number of executives with equity-based compensation has risen to 169 by the end 2011, accounting for approximately 6.6 percent of the total executives in that fiscal year. Table 5.1 reveals that the executive share ownership remains stable low. Specifically, the average of executive share ownership stays around 0.1 percent between 2006 and 2011. Moreover,

both tenure and age span widely during the sample period. In particular, executive tenure ranges from 2 years to more than 21 years, while the age difference between the youngest and the oldest executive is 47 years. Finally, the average proportion of female executive in the sample stays around 12.5 percent.

Table 5.2
Descriptive Statistics: Company Performance and Other Economic Characteristics

Year	ROA (%)	Stock Return (%)	Firm Size (000s Yuan)	Firm Age	Leverage	Volatility	Growth Opportunity
2005	2.71	-14.75	4,426,000	9.99	0.52	0.11	0.73
2006	3.89	69.61	5,086,900	10.99	0.53	0.12	1.38
2007	5.44	172.72	7,002,100	12.00	0.52	0.20	3.51
2008	3.46	-60.35	7,896,300	13.02	0.52	0.18	1.46
2009	3.89	128.51	9,352,200	13.97	0.52	0.14	3.76
2010	4.99	10.02	11,511,000	15.00	0.53	0.12	4.26
2011	4.36	-35.85	13,428,000	16.00	0.54	0.10	3.58
Average	4.11	38.56	8,386,071	13.00	0.53	0.14	2.67

Table 5.2 presents mean values for company performance and other financial characteristics. According to table 5.2, average ROA increases from 2.71 percent to the peak in 2007. However, ROA dramatically declines from 5.44 percent in 2007 to 3.46 percent in 2008. The average ROA starts to increase again after 2008. By the end of 2011, the average ROA has risen to 4.36 percent. Overall, the average ROA during the whole period 2005-2011 is around 4.11 percent, consistent with Firth, Jin, and Zhang (2014) which reports that the average ROA between 2004 and 2009 is close to 4.00 percent.

Annual stock return of Chinese listed companies included in this sample fluctuates greatly during the period 2005-2011. Similar to the pattern of the average ROA, the average stock return rapidly rises between 2005 and 2007, but plunges during 2007-2008. In particular, stock return increases from 69.61 percent in 2006 to 172.72 percent in 2007, but dramatically reduces by 233.07 percent from 2007 to the end of 2008, possibly due to the global financial crisis. The stock return inclines again after 2008, and reaches to 128.51 percent in 2009, nearly threefold from one year ago. Yet this high return does not last very long. By the end of 2011, the average annualized stock return has decreased to -35.85 percent.

In terms of other firm financial characteristics and attributes, firm size (i.e. total assets) increases year by year during the period 2005-2011. By the end of 2011, the average of

firm total assets has increased to 13,428,000,000 Yuan, almost three times as much in 2005. The average firm age is about 13 years, and the average leverage maintains between 0.52 and 0.54. The high volatility occurs between 2007 and 2008, probably because the shocks of global financial crisis. Specifically, the mean volatility is 0.20 and 0.18 in 2007 and 2008, respectively. Finally, the mean growth opportunity is approximately 2.67, reflecting strong growth opportunities.

Table 5.3
Descriptive Statistics: Board Characteristics and Ownership Structure

Variable	Year							Average
	2005	2006	2007	2008	2009	2010	2011	
Remuneration Committee (Dummy)	0.61	0.69	0.90	0.98	0.99	0.99	0.99	0.88
Board Independence (%)	35	35	36	36	36	36	37	36
CEO and Chairman Duality (Dummy)	0.13	0.14	0.14	0.13	0.12	0.13	0.13	0.13
Board Size	9.86	9.71	9.66	9.54	9.46	9.45	9.41	9.58
Supervisory Board Size	4.22	4.17	4.15	4.12	4.09	4.07	4.05	4.12
Largest Shareholding (%)	40.51	35.11	34.57	34.55	33.93	33.32	32.98	35.00
State Owned (Dummy)	0.26	0.22	0.20	0.17	0.08	0.05	0.02	0.18
Foreign Ownership (%)	4.06	4.03	4.05	3.79	3.35	3.06	2.92	3.26

Table 5.3 above describes the evolution of corporate governance characteristics from 2005 to 2011. The proportion of Chinese listed companies with the remuneration committee rapidly increases in 2007. This might be because of the "*Corporate Governance Special Campaign*" held in March, 2007. As mentioned in chapter 2, this special campaign effectively enhanced the corporate governance quality of individual firms. The proportion of independent directors serving on the board of directors stabilizes at around 36 percent, indicating that most of Chinese listed firms appear to comply with the "*Guidance on Independent Directors*". According to the "*Guidance on Independent Directors*", the board of directors should have at least one third independent directors (CSRC, 2001). With respect to the duality of company CEO and chairman of the board of directors, only about 13 percent of the companies have combined CEO and chairman, although the "*Company Law*" does not restrict companies to separate those two positions. The average size of the board of directors stabilizes at 9.58, while the mean value of the supervisory board size is 4.12. This is consistent with the "*Company Law*", which requires that the board of directors shall consist of 5 to 19 members, while the supervisory board shall be composed of not less than 3 members (CSRC, 2006).

Table 5.3 also shows that ownership structure in Chinese listed companies has experienced significant changes between 2005 and 2011. Both the ownership concentration and the proportion of state-owned companies consistently decrease over the seven years, consistent with Conyon and He (2012). To be specific, the average shareholding of the largest shareholder at individual companies decreases from 40.51 percent in 2005 to 32.98 percent in 2011. In addition, the proportion of companies in which the state is the largest shareholder drops from 26 percent in 2005 to only 2 percent in 2011, indicating that Chinese government has gradually released their direct control over listed companies through company privatization. The reduced state ownership may also be influenced by the split-share reform (i.e. converting non-tradable shares to tradable shares) which was officially launched in 2005 (Yeh et al., 2009; Conyon & He, 2012). Foreign ownership is very low during the period 2005-2011. On average, only around 3.26 percent shares are owned by foreign investors.

Table 5.4 reports the correlation matrix for variables regarding executive compensation, managerial attributes, company financial characteristics, and corporate governance characteristics, in order to explore the inter-correlation between variables. The level of executive cash compensation is positively correlated with ROA, but is negatively correlated with stock return. In terms of executive attributes, age, tenure and executive ownership are positively correlated with the level of cash compensation, while there is a negative correlation between female dummy and compensation level. Regarding company financial characteristics, both company size and leverage have positive correlations with the compensation level, while company age and volatility are negatively correlated with the compensation level. All of the corporate governance characteristics tend to be strongly correlated with the compensation level. Specifically, the level of compensation is positively correlated with the remuneration committee dummy, board size and independence, the duality of the company CEO and the board of directors, the size of supervisory board, and foreign ownership. However, it is negatively correlated with the state owned dummy and ownership concentration.

Table 5.4
Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Log(cash)	1											
2. Equity-based Pay	0.16***	1										
3. ROA	0.29***	0.11***	1									
4. Stock Return	-0.12***	-0.02***	0.101***	1								
5. Hierarchy 1 (Highest)	0.169***	0.00326	0.01	-0.00	1							
6. Hierarchy 2 (Second-highest)	-0.01	0.02**	0.01	-0.01	-0.68***	1						
7. Hierarchy 3 (Lowest)	-0.17***	-0.03***	-0.02**	0.0154*	-0.17***	-0.61***	1					
8. Age	0.18***	-0.03***	-0.02*	-0.10***	0.10***	0.04***	-0.16***	1				
9. Tenure	0.22***	0.04***	-0.00	-0.17***	0.04***	-0.03***	-0.01	0.34***	1			
10. Female	-0.06***	-0.01	0.02**	-0.00	-0.11***	-0.00	0.12***	-0.10***	-0.02***	1		
11. Executive Ownership	0.06***	0.03***	0.01	-0.01	0.15***	-0.09***	-0.03***	0.01*	-0.01	-0.03***	1	
12. Firm Size	0.47***	0.09***	0.09***	-0.13***	-0.04***	0.05***	-0.03***	0.12***	0.13***	-0.05***	-0.04***	1
13. Firm Age	-0.04***	-0.04***	-0.11***	0.10***	0.00	0.00	-0.01	-0.00	0.03***	0.00	-0.02***	0.07***
14. Leverage	0.17***	0.04***	-0.06***	-0.12***	0.01	-0.00	-0.01	0.14***	0.28***	0.05***	-0.09***	0.12***
15. Volatility	-0.02**	0.01	-0.08***	-0.12***	0.01*	-0.00	-0.01	-0.01	-0.00	-0.02**	0.01	-0.03***
16. Growth Opportunity	0.00	0.02*	0.00	-0.05***	0.02**	-0.01	-0.01	0.03***	0.07***	-0.00	0.00	-0.06***
17. Committee Dummy	0.20***	0.04***	0.01*	-0.15***	0.01	0.04***	-0.06***	0.08***	0.19***	0.01	0.01	0.14***
18. Duality	0.04***	-0.01	0.00	-0.01	0.00	0.02***	-0.03***	0.04***	0.05***	0.02*	0.07***	-0.04***
19. Board Independence	0.03***	-0.03***	-0.05***	-0.04***	0.02**	0.00	-0.02***	0.001	0.00	-0.01	0.02**	0.03***
20. Board Size	0.14***	0.01	0.02**	-0.02*	-0.04***	0.06***	-0.03***	-0.01	0.00	-0.04***	-0.05***	0.29***
21. Supervisory Board Size	0.03***	-0.06***	-0.01	0.02**	-0.01	0.00	0.01	0.01	-0.00	-0.03***	-0.05***	0.20***
22. Ownership Concentration	-0.02***	-0.13***	0.08***	0.02**	-0.03***	-0.03***	0.07***	0.00	-0.08***	-0.01*	-0.09***	0.20***
23. State Owned	-0.06***	-0.05***	-0.02***	0.08***	-0.02***	-0.00	0.03***	0.02**	-0.06***	-0.01	-0.03***	0.06***
24. Foreign Ownership	0.14***	0.03***	0.01	0.00	-0.02**	-0.01	0.03***	0.07***	-0.00	-0.03***	-0.03***	0.10***

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; Explanation of the variables are presented in table 4.2 in Chapter 4.

Table 5.4 Correlation Matrix (Continued)

Variables	13	14	15	16	17	18	19	20	21	22	23	24
13. Firm Age	1											
14. Leverage	0.12***	1										
15. Volatility	0.06***	0.02**	1									
16. Growth Opportunity	0.01	0.09***	0.06***	1								
17. Committee Dummy	0.01	0.16***	0.10***	0.05***	1							
18. Duality	-0.02**	0.00	0.01	-0.01	-0.01*	1						
19. Board Independence	0.02*	0.05***	0.04***	0.02*	0.04***	0.04***	1					
20. Board Size	0.01	-0.07***	-0.07***	-0.05***	0.07***	-0.06***	-0.27***	1				
21. Supervisory Board	0.05***	0.02**	-0.01	-0.02***	0.05***	-0.08***	-0.09***	0.33***	1			
22. Ownership Concentration	-0.05***	-0.32***	-0.08***	-0.05***	-0.09***	-0.08***	-0.03***	0.05***	0.09***	1		
23. State Owned	0.03***	0.05***	0.01	-0.04***	-0.02***	-0.04***	-0.04***	0.00	0.07***	0.07***		
24. Foreign Ownership	0.01	0.08***	-0.01	-0.00	-0.02**	0.04***	0.00	-0.00	-0.01	-0.03***	0.01	1

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; Explanation of the variables are presented in table 4.2 in Chapter 4.

5.3 Regression Results

This section aims to present the empirical results in relation to hypothesis 1. As mentioned in previous chapter, the potential multi-collinearity problem is examined by VIF tests. It might be problematic if the value of VIF is above 10 (Chen et al, 2003; Wooldridge, 2013). Table 5.5 presents the statistics obtained from the VIF test. The mean value of VIF for all independent variables in the regression model is 1.57, as shown in table 5.5, indicating that there is no potential multi-collinearity in regressions regarding the relation of compensation level and company performance.

Table 5.5
VIF Test: Compensation Level and Company Performance Regression

Variable Name	VIF	Variable Name	VIF
Year Dummy_2011	3.07	Board Size	1.37
Year Dummy_2008	2.91	Ownership Concentration	1.33
Year Dummy_2010	2.71	Committee Dummy	1.28
Year Dummy_2009	2.69	Age	1.24
Area Dummy_4	2.43	Supervisory Board	1.21
Year Dummy_2007	2.05	Industry_4	1.14
Ranking 1	2.01	Board Independence	1.14
Ranking 2	1.97	Industry_3	1.12
Area Dummy_2	1.93	Industry_5	1.12
Stock Return	1.85	State Owned	1.12
Area Dummy_3	1.72	Industry_2	1.11
Firm Age	1.68	Foreign Ownership	1.09
Volatility	1.62	Leverage	1.08
Area Dummy_6	1.60	ROA	1.08
Area Dummy_7	1.52	Executive Ownership	1.06
Firm Size	1.40	Growth Opportunity	1.05
Tenure	1.39	Female	1.05
Area Dummy_5	1.39	Duality	1.04
Mean VIF: 1.57			

Table 5.6 reports the relation of compensation level and company performance when performance is measured by ROA. Column (1), (2) and (3) in table 5.6 show the empirical results obtained from the pooled-sample OLS regression, the standard fixed-effect regression and the FE-2SLS estimator, respectively. In all three models, standard errors are clustered by companies, and year dummies are included, in order to allow for arbitrary within-company correlation, and arbitrary within-year correlation.

The dependent variable is executive compensation, calculated by taking natural logarithm of total cash compensation for individual executives. The regressions use the value of ROA, age, gender, tenure, executive stock ownership and company age in the current fiscal year, while the lagged value of other financial and corporate governance variables is employed.

In addition to year dummies, industry and location dummies are included to control for cross industry and region heterogeneity (Conyon & He, 2012).

Column (1) of Table 5.6 documents the pooled sample estimates using OLS regression. The F-statistic of the OLS method is 77.35 and statistically significant at the 0.01 level (i.e. Prob.>F=0.000). This indicates that the model is correctly specified. R-square of OLS regression shown in Column (1) of Table 5.6 suggests that 46.7% of the sample variation in Log(cash) is explained by independent variables included in the model. The OLS regression results show that the coefficient on ROA is 2.730 and statistically significant at the 0.01 level (i.e. $p<0.01$). This indicates that executive cash compensation increases by 1433.29 percent (i.e. exp(2.730)-1) for a one-unit increase in ROA. The level of compensation is still significantly positively related to ROA when the fixed-effect regression is employed. The relation is still statistically significant at the 0.01 level (i.e. $p<0.01$), but the coefficient is much lower than that obtained from the normal OLS regression. Specifically, one unit change in ROA will positively result in a 154.21 percent (i.e. exp(0.933)-1) change in the level of compensation, as shown in column (2) of Table 5.6.

Column (3) in Table 5.6 presents the empirical results obtained from the FE-2SLS. In the first stage, ROA is regressed on the instrumental variable relative market share and all other independent variables. Column (3A) shows that the relative market share appears to be a significant predictor for ROA. In the second stage, the compensation level is regressed on the predicted value of ROA obtained from the first stage and a set of control variables. There is a significantly positive relation of the level of compensation and ROA, as shown in column (3B) in Table 5.6. In addition, the magnitude of the coefficient of ROA is larger, comparing with the OLS estimates and the standard fixed-effect estimates. To be specific, executive cash compensation is expected to incline by 1587.78 percent (i.e. exp(2.826)-1) for a one-unit increase in ROA. The positive relation between the level of compensation and ROA is in line with the findings in previous studies in the context of China (e.g. Firth et al., 2010; Conyon & He, 2011).

Table 5.6 also shows other determinants of executive cash compensation in Chinese listed companies. Consistent with prior studies, the level of compensation is shown to be positively related to company size (e.g. Firth et al., 1996; 2007), but to be negatively influenced by leverage (e.g. Yermack, 1995; Conyon & He, 2012). The positive relation of company age and compensation level obtained from the FE-2SLS shows that executives at older companies are more likely to get higher compensation. In terms of ownership

structure, both the OLS and the FE-2SLS estimates suggest that the level of compensation is lower in state-owned companies, but higher in companies with higher foreign ownership. These findings are in line with prior studies in the context of China (e.g. Chen et al., 2011; Conyon & He, 2012).

The OLS regression results show other factors which affect the level of executive compensation in China. According to column (1) in Table 5.6, companies with the remuneration committee are more likely to offer higher compensation for executives, consistent with Conyon and He (2011; 2012). In addition, there is positive relation between executive ownership and cash compensation, indicating that executive might take advantage of their ownership power to influence board decisions to increase their compensation level (Lambert et al., 1993; Chen et al., 2011). Finally, the OLS results indicate that there is a positive relationship between the board size and the level of executive compensation, consistent with prior literature (e.g. Core et al., 1999; Firth et al., 2010).

Table 5.7 reports the pay-performance relation when company performance is measured by annualized monthly stock return. In contrast to the significantly positive relationship between the level of compensation and accounting-based performance, the relation of executive cash compensation and company stock return is not shown to be statistically significant. This is consistent with Firth et al. (2007) which indicates that there is no significant relation between stock return and the level of compensation in Chinese listed companies.

Table 5.6
Regression Results: Compensation Level and Company Accounting-based Performance

Variables	OLS	Fixed-effect	FE-2SLS (3)	
	(1)	(2)	1st Stage (3A)	2nd Stage(3B)
	Log(cash)	Log(cash)	ROA	Log(cash)
ROA	2.730***	0.933***		2.826***
	(9.92)	(5.44)		(3.17)
Relative Market Share			0.024***	
			(4.47)	
Hierarchy1	0.617***	0.218***	-0.011	0.241***
	(17.73)	(5.48)	(-1.42)	(5.61)
Hierarchy2	0.284***	0.106***	-0.000	0.106***
	(10.01)	(3.67)	(-0.07)	(3.66)
Age	0.004**	0.050	0.020	0.035
	(2.02)	(0.55)	(0.46)	(1.64)
Tenure	0.017***	-0.004	-0.000	-0.004
	(3.38)	(-0.92)	(-0.21)	(-0.77)
Female	-0.036			
	(-1.02)			
Executive Ownership	2.978**	3.570	0.678	2.351
	(2.09)	(1.06)	(1.05)	(0.67)
Firm Size	0.260***	0.084***	-0.044***	0.140***
	(14.49)	(3.60)	(-9.19)	(3.70)
Leverage	-0.146***	-0.106**	0.033*	-0.168**
	(-3.33)	(-2.27)	(1.68)	(-2.39)
Firm Age	0.000	0.095	-0.011	0.100***
	(0.02)	(1.04)	(-0.24)	(4.96)
Volatility	0.078	0.000	-0.014	0.021
	(0.36)	(0.00)	(-0.74)	(0.17)
Growth Opportunity	-0.000	-0.001	0.000	-0.001
	(-0.15)	(-0.93)	(0.99)	(-1.19)
Committee Dummy	0.173***	0.024	-0.002	0.034
	(4.45)	(1.05)	(-0.65)	(1.47)
Duality	0.054	0.023	-0.009*	0.037
	(0.99)	(0.66)	(-1.82)	(1.07)
Board Independence	0.168	0.237	0.007	0.221
	(0.52)	(1.11)	(0.27)	(1.04)
Board Size	0.194**	0.101	-0.001	0.093
	(2.10)	(1.40)	(-0.07)	(1.34)
Supervisory Board	-0.017	0.055	0.008	0.047
	(-0.21)	(0.85)	(0.69)	(0.72)
Ownership Concentration	-0.003*	-0.002	-0.000	-0.001
	(-1.90)	(-1.32)	(-0.08)	(-1.25)
State Owned	-0.076*	-0.055	0.005*	-0.064*
	(-1.69)	(-1.63)	(1.70)	(-1.89)
Foreign Ownership	0.669***	0.248	-0.056**	0.338*
	(4.73)	(1.23)	(-2.30)	(1.71)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Area Dummies	Yes	Yes	Yes	Yes
Constant	5.385***	6.627**	0.291	.
	(12.38)	(2.19)	(0.21)	.
Observations	14919	14919	14919	14919
R^2	0.467	0.483	0.081	0.418
Adjusted- R^2	0.466	0.482	0.080	0.293
F	77.35***	83.83***	14.21***	387.95***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 5.7
Regression Results: Compensation Level and Company Annual Stock Return

Variables	OLS (1)	Fixed-effect (2)	FE-2SLS (3)	
			1st Stage (3A)	2nd Stage (3B)
	Log(cash)	Log(cash)	Stock Return	Log(cash)
Stock Return	0.011	-0.006		-0.021
	(1.47)	(-1.36)		(-0.25)
Shareholding Transfer Dummy			0.131***	
			(3.01)	
Hierarchy1	0.639***	0.208***	0.027	0.208***
	(17.65)	(5.02)	(0.36)	(5.02)
Hierarchy2	0.298***	0.107***	0.027	0.107***
	(10.06)	(3.55)	(0.53)	(3.57)
Age	0.003	0.057	-0.064	0.056
	(1.44)	(0.42)	(-0.25)	(0.40)
Tenure	0.018***	-0.005	-0.007	-0.005
	(3.31)	(-0.96)	(-1.00)	(-0.96)
Female	-0.022			
	(-0.57)			
Executive Ownership	3.150**	4.117	-9.080	3.976
	(2.03)	(1.19)	(-1.25)	(1.13)
Firm Size	0.278***	0.054**	-0.402***	0.048
	(14.24)	(2.37)	(-7.53)	(1.15)
Leverage	-0.218***	-0.072**	0.545***	-0.064
	(-2.75)	(-2.02)	(3.62)	(-1.09)
Firm Age	-0.003	0.092	-0.090	0.091
	(-0.57)	(0.67)	(-0.36)	(0.64)
Volatility	-0.065	-0.022	-2.184***	-0.054
	(-0.28)	(-0.18)	(-6.99)	(-0.24)
Growth Opportunity	0.000	-0.000	0.005	-0.000
	(0.13)	(-0.55)	(0.53)	(-0.35)
Committee Dummy	0.189***	0.019	-0.071	0.018
	(4.51)	(0.80)	(-0.99)	(0.72)
Duality	0.059	0.015	-0.027	0.015
	(1.01)	(0.44)	(-0.50)	(0.43)
Board Independence	-0.060	0.245	0.160	0.247
	(-0.17)	(1.13)	(0.51)	(1.15)
Board Size	0.173*	0.105	0.018	0.106
	(1.75)	(1.40)	(0.13)	(1.41)
Supervisory Board	-0.033	0.059	-0.116	0.057
	(-0.39)	(0.87)	(-0.69)	(0.85)
Ownership Concentration	-0.002	-0.002	0.002	-0.002
	(-1.24)	(-1.29)	(0.50)	(-1.25)
State Owned	-0.084*	-0.050	-0.022	-0.050
	(-1.76)	(-1.47)	(-0.17)	(-1.47)
Foreign Ownership	0.706***	0.201	-0.404	0.195
	(4.53)	(0.96)	(-0.88)	(0.91)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Area Dummies	Yes	Yes	Yes	Yes
Constant	5.307***	7.000	13.098	.
	(11.30)	(1.54)	(1.60)	.
Observations	14919	14919	14919	14919
R^2	0.413	0.467	0.495	0.466
Adjusted- R^2	0.411	0.466	0.494	0.351
F	65.23***	78.68***	285.2***	79.16***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

5.4 Conclusion

This chapter presents and discusses empirical findings related to the relation of compensation level and company performance in China. Specifically, empirical results obtained from the OLS regression, the standard fixed-effect regression and the FE-2SLS estimator are reported and compared. Overall, all three estimators provide empirical evidence to support that the level of compensation is positively related to accounting-based performance in Chinese listed companies, although the coefficient obtained from the FE-2SLS is larger. In particular, empirical results of the FE-2SLS show that executive compensation is expected to increase by 1587.78 percent for a one-unit increase in ROA. However, results also show that there is no significant relation between the level of cash compensation and company stock return. Therefore, the prediction of hypothesis 1 that the level of executive cash compensation is positively influenced by company performance is partly supported in this study. Consequently, it can be concluded that the level of executive compensation has been positively linked to company performance in China, consistent with the principal-agent theory. However, compensation is more robustly linked to accounting-based performance rather than stock-based performance.

Empirical findings also indicate a positive relation between the level of cash compensation and hierarchical levels within the company. This drives next chapter to deeply explore how the compensation level, the pay-performance link and the likelihood of receiving equity-based compensation vary with hierarchical levels.

Chapter 6: Executive Compensation and Hierarchical Level-Empirical Results

"With respect to the setting of a corporate hierarchy, the strength of the implicit incentives is determined by the extent to which additional effort changes the probability of getting promoted and the "prize" that the manager is awarded upon promotion."

-Merle Ederhof, 2011[14]

6.1 Introduction

This chapter summarizes and discusses the empirical findings regarding the influence of hierarchical level on executive compensation. Specifically, it provides empirical evidence related to hypothesis 5-7 developed in chapter 4. Those three hypotheses reflect three related research questions: How does the level of executive compensation vary with hierarchical levels? How does pay-performance link differ across various hierarchical levels within the company? How does the adoption of equity-based compensation vary with executive hierarchical levels within the company?

The remainder of this chapter is organized as follows. Section 6.2 reports the descriptive statistics. Section 6.3 presents and discusses empirical findings observed using the model and estimator introduced in chapter 4. Finally, the conclusion is summarized in Section 6.4.

6.2 Descriptive Statistics

Table 6.1 below describes the variation of total cash compensation by hierarchical levels and year. As shown in Table 6.1, the level of cash compensation increases with the hierarchical levels. Overall, during the whole period 2006-2011, cash compensation increases from 251,070 Yuan to 374,447 Yuan if one moves from hierarchy 3 (i.e. the lowest level) to hierarchy 2 (i.e. the middle level), and the compensation level grows to 549,172 Yuan if the executive is promoted to hierarchy 1 (i.e. the highest level). This pattern is also applicable to individual year. For example, in 2006, pay rises from 160,589 Yuan to 228,366 Yuan if one is promoted from hierarchy 3 to 2, and inclines to 344,097 Yuan if the executive is further promoted to the highest level. Those descriptive statistics

[14] Ederhof, M. (2011).Incentive Compensation and Promotion-Based Incentives of Mid-Level Managers: Evidence from a Multinational Corporation. Accounting Review, 86(1), 131-153. doi:10.2308/accr.00000007

are consistent with previous studies such as Lambert et al.(1993), Lin et al. (2009), and Chen et al. (2011), and provide the preliminary support for the hypothesis 5 that compensation level is positively related to hierarchical levels.

In addition, Table 6.1 shows that the compensation differences between hierarchy 1 and hierarchy 2 is sustainably higher than compensation gaps between hierarchy 2 and hierarchy 3 over the six years, consistent with Chen et al. (2011). To be specific, during the whole period 2006-2011, moving up from hierarchy 3 to hierarchy 2 is associated with a 123,377 Yuan increases in the level of compensation, while compensation will increase by 174,725 Yuan if one is promoted from hierarchy 2 to hierarchy 1.

Table 6.2 presents the descriptive statistics regarding the adoption of equity-based compensation, by position hierarchy and year. As can be seen from table 6.2, the proportion of executives with equity-based compensation is very low. Overall, only about 5 percent executives have been offered equity-based compensation during the period 2006-2011. However, the percentage of executives who have been provided equity-based compensation increases year by year. To be specific, only 3.6 percent and 3.7 percent executives have been offered equity-based compensation in 2006 and 2007, respectively. The proportion increases by 1 percent in 2008, and grows to 5.7 percent in 2009. There is a slow growth between 2009 and 2010. By the end of 2011, the proportion of executives which has been granted the equity-based compensation has grown to 6.6 percent.

Table 6.3 also shows that the likelihood of receiving equity-based compensation varies with hierarchical levels. Overall, the proportion of executives with equity-based compensation for hierarchy 2 is 0.1 percent higher than hierarchy 1, although both hierarchical levels have the percentage above the mean. In addition, as the lowest level, hierarchy 3 has the lowest percentage of executives with equity-based compensation. To be specific, only 3.6 percent executives at hierarchy 3 have been provided equity-based compensation, 1.4 lower than the mean percentage for the whole sample.

Table 6.1
Descriptive Statistics: Variation of Executive Compensation by Hierarchical Level and Year

Year	Position Hierarchy	Mean	Standard Deviation	Number of Observations
2006	Hierarchy 1 (Highest)	344.097	447.601	306
	Hierarchy 2 (Middle)	228.366	189.368	1473
	Hierarchy 3 (Lowest)	160.589	153.301	372
	Total	233.108	244.350	2151
2007	Hierarchy 1 (Highest)	456.855	635.812	387
	Hierarchy 2 (Middle)	316.760	318.020	1821
	Hierarchy 3 (Lowest)	227.811	223.690	395
	Total	324.091	377.299	2603
2008	Hierarchy 1 (Highest)	497.691	591.385	382
	Hierarchy 2 (Middle)	338.665	293.758	1791
	Hierarchy 3 (Lowest)	240.175	190.760	340
	Total	349.513	352.829	2513
2009	Hierarchy 1 (Highest)	520.110	524.182	418
	Hierarchy 2 (Middle)	381.646	343.719	1798
	Hierarchy 3 (Lowest)	250.639	163.137	311
	Total	388.427	371.365	2527
2010	Hierarchy 1 (Highest)	657.242	681.810	437
	Hierarchy 2 (Middle)	452.456	391.902	1831
	Hierarchy 3 (Lowest)	312.633	222.507	288
	Total	471.714	451.553	2556
2011	Hierarchy 1 (Highest)	725.160	826.810	472
	Hierarchy 2 (Middle)	498.919	454.262	1836
	Hierarchy 3 (Lowest)	362.008	285.803	261
	Total	526.578	540.050	2569
2006-2011	Hierarchy 1 (Highest)	549.172	653.984	2402
	Hierarchy 2 (Middle)	374.447	356.782	10550
	Hierarchy 3 (Lowest)	251.070	216.405	1967
	Total	386.312	414.491	14919

Table 6.2
Descriptive Statistics:
Variation of Receiving Equity-based Compensation by Hierarchical Level and Year

Year	Position Hierarchy	Mean	Standard Deviation	Number of Observations
2006	Hierarchy 1 (Highest)	0.039	0.194	306
	Hierarchy 2 (Middle)	0.037	0.190	1473
	Hierarchy 3 (Lowest)	0.027	0.162	372
	Total	0.036	0.186	2151
2007	Hierarchy 1 (Highest)	0.036	0.187	387
	Hierarchy 2 (Middle)	0.040	0.195	1821
	Hierarchy 3 (Lowest)	0.028	0.165	395
	Total	0.037	0.189	2603
2008	Hierarchy 1 (Highest)	0.052	0.223	382
	Hierarchy 2 (Middle)	0.048	0.213	1791
	Hierarchy 3 (Lowest)	0.035	0.185	340
	Total	0.047	0.212	2513
2009	Hierarchy 1 (Highest)	0.053	0.223	418
	Hierarchy 2 (Middle)	0.060	0.237	1798
	Hierarchy 3 (Lowest)	0.048	0.214	311
	Total	0.057	0.232	2527
2010	Hierarchy 1 (Highest)	0.062	0.241	437
	Hierarchy 2 (Middle)	0.060	0.238	1831
	Hierarchy 3 (Lowest)	0.035	0.183	288
Total		0.058	0.233	2556
2011	Hierarchy 1 (Highest)	0.064	0.244	472
	Hierarchy 2 (Middle)	0.069	0.254	1836
	Hierarchy 3 (Lowest)	0.046	0.210	261
	Total	0.066	0.248	2569
2006-2011	Hierarchy 1 (Highest)	0.052	0.222	2402
	Hierarchy 2 (Middle)	0.053	0.224	10550
	Hierarchy 3 (Lowest)	0.036	0.185	1967
	Total	0.050	0.219	14919

6.3 Regression Results

This section explores the relation of executive compensation and hierarchical levels. In particular, it focuses on empirical findings related to hypothesis 5, hypothesis 6 and hypothesis 7 which are developed in chapter 4. Table 6.3 presents the results of VIF test for independent variables included in examining the influence of hierarchical levels on the level of compensation, in order to identify whether there is a potential multi-collinearity problem. As seen in Table 6.3, the mean value of VIF is only 1.57, far less than 10, suggesting that variables do not have a severe multi-collinearity problem.

Table 6.3
VIF Test: Compensation Level and Hierarchical Level Regression

Variable Name	VIF	Variable Name	VIF
Year Dummy_2011	3.07	Board Size	1.37
Year Dummy_2008	2.91	Ownership Concentration	1.33
Year Dummy_2010	2.71	Presence of Remuneration Committee	1.28
Year Dummy_2009	2.69	Age	1.24
Area Dummy_4	2.43	Supervisory Board	1.21
Year Dummy_2007	2.05	Industry_4	1.14
Ranking 1	2.01	Board Independence	1.14
Ranking 2	1.97	Industry_3	1.12
Area Dummy_2	1.93	Industry_5	1.12
Stock Return	1.85	State Owned	1.12
Area Dummy_3	1.72	Industry_2	1.11
Firm Age	1.68	Foreign Ownership	1.09
Volatility	1.62	Leverage	1.08
Area Dummy_6	1.60	ROA	1.08
Area Dummy_7	1.52	Executive Ownership	1.06
Firm Size	1.40	Growth	1.05
Tenure	1.39	Female	1.05
Area Dummy_5	1.39	CEO and Board Chairman Duality	1.04
Mean VIF: 1.57			

Table 6.4 shows the relationship between the level of cash compensation and executive hierarchical levels. To be specific, column (1) and (2) report the empirical results of the pooled sample OLS regression. Columns (3) and (4) present the results of the fixed-effect method. In addition, column (1) and (3) include the accounting-based performance measure, and column (2) and (4) use the stock-based performance measure. The dependent variable is executive compensation, defined as the log transformation of the total cash compensation. Independent variables include hierarchy dummies, managerial attributes, company economic and corporate governance characteristics. It is worth noting that one year lagged company performance is employed as a control variable in regressions. Following models in the last chapter, year dummies are included to allow for arbitrary within-year correlation. Finally, industry and location dummies are included to account for cross industry and region heterogeneity (Conyon & He, 2012).

All models have F-statistics which are statistically significant at the 0.01 level (i.e. Prob.>F=0.000), indicating that the model is correctly specified. In addition, all models have R-square over than 0.4, suggesting that more than 40 percent of the sample variation in Log(cash) is explained by independent variables included in the model. On the whole, in all four models, both hierarchy 1 and hierarchy 2 have significantly positive coefficients, and the coefficient on hierarchy 1 is larger than that on hierarchy 2. Specifically, the pooled sample OLS estimate shown in column (1) suggest that compensation will increase

by 34 percent (i.e. 0.62-0.28) if an executive is promoted from hierarchy 2 to hierarchy 1, while compensation increases by 28 percent if an executive is promoted from hierarchy 3 to hierarchy 2. Similar findings are obtained from the fixed-effect model, although the coefficients are relatively smaller. Column (3) in Table 6.4 shows that there will be an 11 percent (i.e. 0.22-0.11) increase in compensation if one is promoted from hierarchy 2 to hierarchy 1, while compensation will rise by 10 percent when an executive at hierarchy 3 moves up to hierarchy 2. The findings are robust when stock market-based performance measure is employed. Therefore, the hypothesis 5 related to tournament theory's prediction that the level of compensation is an increasing function of hierarchical levels is supported.

It is worth noting that previous literature (e.g. Lambert et al., 1993; Conyon & Sadler, 2001) has suggested that the relationship between executive compensation and hierarchical levels is convex if the coefficients satisfy the following conditions. First of all, the coefficient on hierarchy 2 (namely, β_2) must be positive. Secondly, the difference between the coefficients on hierarchy 1 (namely, β_1) and hierarchy 2 must not be less than the coefficient on hierarchy 2. In other words, there will be a convex relationship between executive compensation and position hierarchy if $\beta_1 - 2\beta_2 \geq 0$. This condition is supported by empirical results shown in Table 6.4. Specially, when performance is measured by ROA, $\beta_1 - 2\beta_2$ is 0.06 and 0.00 for OLS and the fixed-effect estimator, respectively. Therefore, it can be concluded that the level of executive compensation is an increasing function of hierarchical levels in Chinese listed companies, consistent with the tournament theory. In addition, the relationship between executive compensation and hierarchical levels tends to be convex, according to the estimations controlling for the influence of the accounting-based performance.

Table 6.4
Regression Results: Compensation Level and Hierarchical Level

Variable	Dependent Variable: Log(cash)			
	Pooled OLS		Fixed-effect	
	(1)	(2)	(3)	(4)
Hierarchy 1	0.62***	0.64***	0.22***	0.21***
	(17.73)	(17.65)	(5.48)	(5.02)
Hierarchy 2	0.28***	0.30***	0.11***	0.11***
	(10.01)	(10.06)	(3.67)	(3.55)
Age	0.00**	0.00	0.05	0.06
	(2.02)	(1.44)	(0.55)	(0.42)
Tenure	0.02***	0.02***	-0.00	-0.00
	(3.38)	(3.31)	(-0.92)	(-0.96)
Female	-0.04	-0.02		
	(-1.02)	(-0.57)		
Executive Ownership	2.98**	3.15**	3.57	4.12
	(2.09)	(2.03)	(1.06)	(1.19)
ROA	2.73***		0.93***	
	(9.92)		(5.44)	
Stock Return		0.01		-0.01
		(1.47)		(-1.36)
Firm Size	0.26***	0.28***	0.08***	0.05**
	(14.49)	(14.24)	(3.60)	(2.37)
Leverage	-0.15***	-0.22***	-0.11**	-0.07**
	(-3.33)	(-2.75)	(-2.27)	(-2.02)
Firm Age	0.00	-0.00	0.09	0.09
	(0.02)	(-0.57)	(1.04)	(0.67)
Volatility	0.08	-0.07	0.00	-0.02
	(0.36)	(-0.28)	(0.00)	(-0.18)
Growth Opportunity	-0.00	0.00	-0.00	-0.00
	(-0.15)	(0.13)	(-0.93)	(-0.55)
Presence of Remuneration Committee	0.17***	0.19***	0.02	0.02
	(4.45)	(4.51)	(1.05)	(0.80)
CEO and Board Chairman Duality	0.05	0.06	0.02	0.02
	(0.99)	(1.01)	(0.66)	(0.44)
Board Independence	0.17	-0.06	0.24	0.25
	(0.52)	(-0.17)	(1.11)	(1.13)
Board Size	0.19**	0.17*	0.10	0.11
	(2.10)	(1.75)	(1.40)	(1.40)
Supervisory Board Size	-0.02	-0.03	0.06	0.06
	(-0.21)	(-0.39)	(0.85)	(0.87)
Ownership Concentration	-0.00*	-0.00	-0.00	-0.00
	(-1.90)	(-1.24)	(-1.32)	(-1.29)
State Owned	-0.08*	-0.08*	-0.05	-0.05
	(-1.69)	(-1.76)	(-1.63)	(-1.47)
Foreign Ownership	0.67***	0.71***	0.25	0.20
	(4.73)	(4.53)	(1.23)	(0.96)
Year/Indusry/Area Dummy	Yes	Yes	Yes	Yes
Constant	5.38***	5.31***	6.63**	7.00
	(12.38)	(11.30)	(2.19)	(1.54)
Observations	14919	14919	14919	14919
R^2	0.467	0.413	0.483	0.467
Adjusted- R^2	0.466	0.411	0.482	0.466
F	77.35***	65.23***	83.83***	78.68***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 6.5
VIF Test: Hierarchical Level and Pay-performance Link Regression

Variable Name	VIF	Variable Name	VIF
Panel A			
ROA	9.12	Area Dummy_5	1.39
Hierarchy2*ROA	8.52	Board Size	1.37
Hierarchy1*ROA	3.08	Ownership Concentration	1.33
Year Dummy_2011	2.9	Presence of Remuneration Committee	1.28
Hierarchy 1	2.74	Age	1.24
Year Dummy_2008	2.68	Supervisory Board	1.21
Year Dummy_2010	2.66	Board Independence	1.14
Hierachy2	2.64	Industry_4	1.14
Year Dummy_2009	2.62	Industry_3	1.12
Area Dummy_4	2.43	Industry_5	1.12
Area Dummy_2	1.92	State Owned	1.12
Year Dummy_2007	1.89	Industry_2	1.11
Area Dummy_3	1.72	Foreign Ownership	1.09
Firm Age	1.68	Leverage	1.06
Volatility	1.62	Executive Ownership	1.06
Area Dummy_6	1.6	Growth	1.05
Area Dummy_7	1.52	Female	1.05
Firm Size	1.40	CEO and Board Chairman Duality	1.04
Tenure	1.39	**Mean VIF: 2.03**	
Panel B			
Stock Return	11.3	Area Dummy_5	1.39
Hierarchy2* Stock Return	8.82	Board Size	1.37
Year Dummy_2011	3.07	Ownership Concentration	1.33
Year Dummy_2008	2.91	Presence of Remuneration Committee	1.33
Hierarchy1* Stock Return	2.81	Age	1.23
Year Dummy_2010	2.70	Supervisory Board	1.21
Year Dummy_2009	2.69	Board Independence	1.13
Area Dummy_4	2.42	Industry_4	1.13
Hierachy1	2.35	Industry_3	1.12
Hierachy2	2.35	Industry_5	1.12
Year Dummy_2007	2.05	State Owned	1.12
Area Dummy_2	1.93	Industry_2	1.11
Area Dummy_3	1.72	Foreign Ownership	1.09
Firm Age	1.68	Leverage	1.07
Volatility	1.62	Executive Ownership	1.06
Area Dummy_6	1.6	Growth	1.05
Area Dummy_7	1.52	Female	1.05
Tenure	1.39	CEO and Board Chairman Duality	1.04
Firm Size	1.39	**Mean VIF: 2.09**	

Table 6.5 reports the results of VIF test for variables involved in estimating the influence of hierarchical levels on pay-performance link. Panel A includes the accounting-based performance measure, and panel B includes company stock return. The mean value of VIF is 2.03 in panel A, while the mean VIF shown in panel B is 2.09. Both values are less than 10, although introducing interaction terms increases multi-collinearity, indicating that multi-collinearity may not be a serious problem in this estimation.

Table 6.6 presents the influence of hierarchical levels on pay-performance link through introducing the interaction term. Specifically, hierarchy dummies are interacted with

performance measures. Following the estimations of pay-performance relation shown in chapter 5, empirical results obtained from pooled sample OLS regression, fixed-effect approach and the FE-2SLS estimator are reported and discussed. F-statistics are statistically significant at the 0.01 level, indicating that the models are correctly specified. According to the estimates of FE-2SLS shown in column (3), when accounting-based performance is employed, both hierarchy 1 and hierarchy 2 have significantly higher pay-performance link, comparing with hierarchy 3. Specifically, the estimated pay-performance link for executives at hierarchy 1 is 448 percent (i.e. 5.2-0.72), and for executives at hierarchy 2, it is 370 percent (i.e. 4.42-0.72). However, pay-performance lnik for executives at hierarchy 3 is not significant. Although these findings are not supported by pooled sample OLS regression and the fixed-effect model, this study relies on findings obtained from the FE-2SLS due to the potential endogenous problem. Since the significant difference of pay-performance link between hierarchical levels is not observed when annual stock return is employed, hypothesis 6 that the level of compensation and company performance are more aligned at the higher hierarchical level is partly supported. To be specific, the level of compensation and company accounting-based performance are more aligned at the higher hierarchical level.

Table 6.6
Regression Results: Pay-performance Link and Hierarchical Level

Variable	Dependent Variable: Log(cash)					
	OLS	FE	2SLS	OLS	FE	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Hierarchy1	0.58***	0.20***	0.02	0.64***	0.21***	0.22*
	(13.28)	(4.72)	(0.21)	(17.25)	(5.01)	(1.80)
Hierarchy2	0.27***	0.10***	-0.10	0.30***	0.10***	0.06
	(7.23)	(3.20)	(-1.09)	(9.97)	(3.46)	(0.57)
ROA	2.29***	0.79***	-0.72			
	(4.64)	(2.84)	(-0.67)			
Hierarchy1*ROA	0.80	0.40	5.20***			
	(1.36)	(1.25)	(2.62)			
Hierarchy2*ROA	0.44	0.11	4.42**			
	(0.79)	(0.38)	(2.48)			
Stock Return				0.02*	-0.01	-0.09
				(1.93)	(-1.49)	(-0.56)
Hierarchy1* Stock Return				-0.01	0.00	-0.07
				(-0.80)	(0.20)	(-0.34)
Hierarchy2* Stock Return				-0.01	0.01	0.08
				(-1.31)	(1.00)	(0.56)
Managerial Attribute	Yes	Yes	Yes	Yes	Yes	Yes
Firm Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Board Structure	Yes	Yes	Yes	Yes	Yes	Yes
Ownership Structure	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Area Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14919	14919	14919	14919	14919	14919
R^2	0.467	0.483	0.341	0.413	0.467	0.431
Adjusted- R^2	0.466	0.482	0.199	0.411	0.466	0.309
F	73.68***	78.17***	102.6***	62.33***	73.90***	73.61***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 6.7
Regression Results: Equity-based Compensation and Hierarchical Level

Variable	Dependent Variable: Equity-based Pay (Dummy)	
	Odds Ratio	Coefficient
Hierarchy1	1.44	0.36
	(1.30)	(1.30)
Hierarchy2	1.47	0.39
	(1.57)	(1.57)
Age	0.96***	-0.04***
	(-2.93)	(-2.93)
Tenure	1.04	0.04
	(1.41)	(1.41)
Female	0.75	-0.29
	(-1.22)	(-1.22)
Executive Ownership	5.71	1.74
	(0.32)	(0.32)
ROA	594.66***	6.39***
	(4.28)	(4.28)
Annual Stock Return	1.04	0.04
	(0.58)	(0.58)
Firm Size	1.75***	0.56***
	(3.81)	(3.81)
Leverage	0.26**	-1.36**
	(-2.33)	(-2.33)
Firm Age	0.95	-0.05
	(-1.03)	(-1.03)
Volatility	0.98	-0.02
	(-0.01)	(-0.01)
Growth Opportunity	1.01**	0.01**
	(2.45)	(2.45)
Liquidity Constraints	0.88	-0.13
	(-0.52)	(-0.52)
Committee Dummy	1.68	0.52
	(0.87)	(0.87)
CEO and Board Chairman Duality	0.66	-0.42
	(-1.05)	(-1.05)
Board Independence	0.01***	-5.22***
	(-2.66)	(-2.66)
Board Size	0.73	-0.32
	(-0.51)	(-0.51)
Supervisory Board Size	0.41	-0.88
	(-1.34)	(-1.34)
Ownership Concentration	0.95***	-0.05***
	(-5.34)	(-5.34)
State Owned	0.45**	-0.79**
	(-2.17)	(-2.17)
Foreign Ownership	0.54	-0.62
	(-0.69)	(-0.69)
Year/ Industry/Area Dummy	Yes	
Constant	-7.73**	
	(-2.46)	
Observations	14919	
Pseudo R^2	0.161	
Adjusted- R^2	0.149	
Chi^2	235.1***	

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 6.7 reports the empirical results on the relation of equity-based compensation and executive hierarchical levels. Both the coefficient and odd ratios are reported. The results are obtained through estimating the logistic regression model with clustered standard errors by companies. The dependent variable is equity-based compensation dummy which is equal to one if the executive has been granted equity-based compensation in the fiscal year, and zero otherwise. Following the compensation level model, the logistic model includes independent variables such as hierarch dummies, firm economic and corporate governance characteristics, and managerial attributes. Year, industry and location dummies are also included. Following prior studies (e.g. Conyon & He, 2012), firm economic and corporate governance variables are lagged by one year to mitigate the potential endogenous problem resulting from the two-way causality.

As can be seen from table 6.7, executives at hierarchy 1 or hierarchy 2 are more likely to receive equity-based compensation (i.e. coefficient>0), in contrast to executives at hierarchy 3, but the difference is not significant. Therefore, the prediction of hypothesis 7 that executives at the higher hierarchical level are more likely to receive equity-based compensation is not supported. One potential reason might be equity-based compensation is emerging in China. Table 6.7 also shows other important determinants of the likelihood of receiving equity-based compensation. For instance, older executives are less likely to receive equity-based compensation, consistent with Conyon and He (2012). This indicates that executives with short time horizon may require short-term incentive compensation. In terms of company economic characteristics, executives in Chinese listed companies with larger size, higher accounting-based performance, and lower leverage are more likely to be granted equity-based compensation. In addition, the propensity of receiving equity-based compensation is greater for executives in companies with higher growth opportunities. This is consistent with prior studies such as Smith and Watts (1992), Gaver and Gaver (1993) and Kole (1997) who suggest that the more growth opportunities the company has, the more likely it is to adopt equity-based compensation. In terms of ownership structure, executives in companies with higher ownership concentration are less likely to be granted equity-based compensation. This might be because the higher ownership concentration might result in better monitoring of shareholders on managerial actions (Firth et al., 2007), and as argued

by Jensen and Warner (1998), shareholder monitoring may work as an alternative governance mechanism to incentive compensation. Finally, executives at state-owned companies have lower propensity of being offered equity-based pay. This indicates that there might be other alternative mechanisms that could explain incentive schemes in Chinese listed companies, in addition to the economic considerations based on the classical principal-agent theory (Conyon & He, 2012).

6.4 Conclusion

This chapter explores how the compensation level, the pay-performance link, and the likelihood of receiving equity-based compensation vary with hierarchical levels within Chinese listed companies. Specifically, the level of executive compensation is found to be an increasing function of hierarchical levels, consistent with the hypothesis 5 developed from the tournament perspective. In addition, the relation of compensation level and hierarchical levels tends to be convex. In terms of pay-performance link, it is found that the level of compensation and accounting-based performance are more aligned at the higher hierarchical level, but the relation of compensation level and stock return does not significantly vary with hierarchical levels. Finally, this study does not find a significant influence of hierarchical levels on the likelihood of receiving equity-based compensation to support the prediction of hypothesis 7. Consequently, it can be concluded that Chinese listed companies have started to motivate executives through the tournament prize in the internal labour market. They have also balanced promotion opportunities and the incentive compensation when design compensation plans for individual executives at various hierarchical levels. However, the financial incentive for higher level executives with less promotion opportunities are mainly contributed by accounting performance based compensation (e.g. bonus) in China.

Chapter 7: Executive Compensation and Remuneration Committee-Empirical Results

"As a practical matter, his rate of pay is also influenced by the significant and highly convenient role the executive plays in establishing it; much that accrues to the senior corporate executive is in response to his own inspired generosity"

-John Kenneth Galbraith, 1983, "The Anatomy of Power"[15]

7.1 Introduction

Empirical findings regarding the role of the remuneration committee in determining executive compensation are reported and discussed in this chapter. Those empirical results are related to hypothesis 2-4 and hypothesis 8-13 developed in chapter 4. Specifically, hypothesis 2-4 are about the influence of the presence of the remuneration committee on compensation level, pay-performance link, and the adoption of equity-based compensation, while hypothesis 8-13 are related to the role of managerial power, reflected by the composition and size of the remuneration committee, in determining compensation level, pay-performance relation, and the likelihood of receiving equity-based compensation.

The rest of this chapter is organized as follows. Descriptive statistics are reported in section 7.2. Regression results regarding the role of the remuneration committee in setting executive compensation are presented and discussed in section 7.3, followed by a conclusion in Section 7.5.

7.2 Descriptive Statistics

Table 7.1 compares the mean and standard deviation for executive compensation between companies with the remuneration committee and companies without the remuneration committee by year and for the whole sample period. According to Table 7.1, the mean of cash pay for executives from firms which have adopted the remuneration committee tends to be always higher than those in firms in which the remuneration committee has not been established. Specifically, the mean of

[15] GALBRAITH, J. K. 1983. THE ANATOMY OF POWER, United States, Houghton Mifflin Company

executive cash compensation for companies with the remuneration committee is about 408,421 Yuan during the period 2006-2011, almost 161,454 Yuan higher than that of firms without the remuneration committee. In addition, for the whole sample, the proportion of executives with equity-based compensation for companies with the remuneration committee is 2.8 percent higher than that of companies without the remuneration committee. Table 7.1 also shows that as more and more Chinese listed companies has started to establish the remuneration committee following the "*Code of Corporate Governance*", the number of observations in this group increases year by year, whereas the number of observations from companies without the remuneration committee significantly decreases.

Table 7.1
Descriptive Statistics: Comparison of Executive Compensation-
Companies without the Remuneration Committee vs. with the Remuneration Committee

Year	Variable	Lagged Remuneration Committee Dummy			
		=0		=1	
		Mean	Standard Deviation	Mean	Standard Deviation
2006	Pay (000s Yuan)	204.142	184.307	251.741	274.616
	Equity-based Pay	0.033	0.179	0.037	0.190
	Observations	842		1309	
2007	Pay (000s Yuan)	250.838	226.294	357.540	424.801
	Equity-based Pay	0 .001	.035	0.054	0.226
	Observations	816		1787	
2008	Pay (000s Yuan)	329.972	430.079	351.768	342.839
	Equity-based Pay	0	0	0.052	0.223
	Observations	260		2253	
2009	Pay (000s Yuan)	286.450	209.049	390.738	373.931
	Equity-based Pay	0.142	0.353	0.055	0.228
	Observations	56		2471	
2010	Pay (000s Yuan)	344.472	201.012	473.531	453.892
	Equity-based Pay	0.222	0.422	0.055	0.228
	Observations	36		2520	
2011	Pay (000s Yuan)	416.558	242.398	528.008	542.724
	Equity-based Pay	0.242	0.435	0.063	0.244
	Observations	33		2536	
2006-2011	Pay (000s Yuan)	246.967	250.987	408.421	430.701
	Equity-based Pay	0.026	0.159	0.054	0.227
	Observations	2043		12876	

Table 7.2 reports the t-statistic for mean differences and the z-statistic for median differences in the level of cash compensation and the likelihood of being granted equity-based pay for companies without the remuneration committee and companies with the remuneration committee. As shown in Table 7.2, the two groups of companies differ significantly at the 0.01 level on the level of cash compensation and

the proportion of executives with the equity-based compensation. Specifically, companies which have already adopted the remuneration committee reward their executives higher cash pay and are more likely to provide equity-based compensation for their executives, comparing with companies without the remuneration committee.

Table 7.2
T-statistic and Z-statistic for Differences of Executive Compensation: Firms without a Remuneration Committee vs. Firms with a Remuneration Committee

Variable	T-statistic for Mean Differences	Mann-Whitney Z-statistic for Median Differences
Level of Cash Compensation [a]	-24.71***	-24.03***
Adoption of Equity-based Pay [b]	-5.45***	-5.44***
Number of Observations	14919	

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

a: Measured by the log tranformation of cash compensation

b: Dummy variable, equal to one if an executive has been offered equity-based compensation in the fiscal year, and zero otherwise.

Table 7.3 describes the evolution of the size and the composition of the remuneration committee in Chinese listed companies between 2005 and 2010. Both the number of members and the proportion of insiders serving on the remuneration committee generally decrease year by year, although the changes are not obvious. However, both of them have a wide difference between the minimum and maximum values. In general, the number of committee members ranges from 2 to 12 in this sample, and the proportion of insiders spans from 0 to 100 percent during the period 2005-2010.

Table 7.3
Descriptive Statistics: Size and Composition of the Remuneration Committee

Year	Number of Members				Proportion of Insiders			
	Mean	SD	Min	Max	Mean	SD	Min	Max
2005	3.91	1.15	2	7	38%	11%	0	83%
2006	3.88	1.14	2	12	38%	11%	0	80%
2007	3.82	1.10	2	9	37%	11%	0	83%
2008	3.80	1.10	2	8	36%	11%	0	83%
2009	3.79	1.09	2	8	35%	11%	0	83%
2010	3.79	1.11	2	8	35%	11%	0	100%
2005-2010	3.82	1.11	2	12	36%	11%	0	100%

7.3 Regression Results

This section aims to analyse the influence of the presence of the remuneration committee and managerial power, represented by the composition of the remuneration committee, on executive compensation plans. To be specific, the empirical findings are related to hypothesis 2-4 and hypothesis 8-13 developed in chapter 4.

7.3.1 Presence of the Remuneration Committee and Compensation Plans

Table 7.4 gives the results of VIF test for independent variables included in testing the influence of the presence of the remuneration committee on pay level, in order to identify whether there is a potential multi-collinearity problem in the regression analysis. As seen in table 7.4, the mean value of VIF is only 1.57, far less than 10, indicating that there is no severe multi-collinearity problem among variables in the regression.

Table 7.4
VIF Test: Remuneration Committee Presence and Compensation Level Regression

Variable Name	VIF	Variable Name	VIF
Year Dummy_2011	3.07	Board Size	1.37
Year Dummy_2008	2.91	Ownership Concentration	1.33
Year Dummy_2010	2.71	Committee Dummy	1.28
Year Dummy_2009	2.69	Age	1.24
Area Dummy_4	2.43	Supervisory Board	1.21
Year Dummy_2007	2.05	Industry_4	1.14
Ranking 1	2.01	Board Independence	1.14
Ranking 2	1.97	Industry_3	1.12
Area Dummy_2	1.93	Industry_5	1.12
Stock Return	1.85	State Owned	1.12
Area Dummy_3	1.72	Industry_2	1.11
Firm Age	1.68	Foreign Ownership	1.09
Volatility	1.62	Leverage	1.08
Area Dummy_6	1.60	ROA	1.08
Area Dummy_7	1.52	Executive Ownership	1.06
Firm Size	1.40	Growth Opportunity	1.05
Tenure	1.39	Female	1.05
Area Dummy_5	1.39	Duality	1.04
Mean VIF: 1.57			

Table 7.5 reports the empirical results of the test of hypothesis 2, based on the regression equation 4.2 given in chapter 4. Column (1), column (2) and column (3) present the results obtained from the OLS, the fixed-effect and the FE-2SLS estimator, respectively. The dependent variable is the level of executive cash compensation, calculated by taking natural logarithm of total cash compensation for individual executives. The predictor is the remuneration committee dummy equal to one if the company has established the remuneration committee in the last fiscal year. Other independent variables include managerial attributes, company economic and corporate governance characteristics. Following models in previous chapters, year dummies are included to allow for arbitrary within-year correlation, while industry and location dummies are included to account for cross industry and region heterogeneity. Table 7.5 shows that all three models have F-statistics statistically significant at the 0.01 level (i.e. Prob.>F=0.000), suggesting that the models are correctly specified.

Table 7.5
Regression Results:
Compensation Level and Presence of the Remuneration Committee

Variable	Dependent Variable: Log(cash)		
	OLS	FE	FE-2SLS
	(1)	(2)	(3)
Committee Dummy	0.172***	0.025	0.036
	(4.45)	(1.07)	(1.43)
Managerial Attribute	Yes	Yes	Yes
Firm Characteristics	Yes	Yes	Yes
Board Structure	Yes	Yes	Yes
Ownership Structure	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes
Area Dummy	Yes	Yes	Yes
Observations	14919	14919	14919
R^2	0.467	0.483	0.413
Adjusted- R^2	0.466	0.482	0.286
F	76.24***	80.75***	154.8***

t statistics in parentheses; * p<0.1, ** p<0.05, *** p<0.01

Consistent with prior studies in the context of both western countries (e.g. Main & Johnston, 1993; Conyon & Peck, 1998) and China (e.g. Conyon & He, 2011; 2012), the OLS regression results reported in column (1) suggest that the level of executive cash compensation tends to be significantly higher for companies with remuneration committee, comparing with companies without the remuneration committee. Specifically, executives from companies with the remuneration committee, on average, receive cash compensation 18.8 percent (i.e. exp(0.172)-1) higher than executives at companies without the remuneration committee, holding other control variables constant. This is opposite to the hypothesis 2 which predicts that the level of cash compensation will be lower in companies with the remuneration committee. The coefficient of presence of the remuneration committee remains positive when fixed-effect and 2SLS estimators are employed, but the significance disappears. Therefore, the hypothesis 2 is not supported.

However, the purpose of the remuneration committee may not be specifically to hold down or boost the level of compensation (Main & Johnston, 1993). As suggested by Conyon (1997), the remuneration committee should be a forum to consider the appropriate design of the compensation structure for executives rather than being regarded simply as an organisational device for checking the growth in executive

compensation. This drives the analysis of the role of the remuneration committee in designing compensation structure in the next sections.

The mean value of VIF shown in panel A and panel B of Table 7.6 is 1.86 and 1.95, respectively, far less than the upper limit value 10. This indicates that there is no serious collinearity problem among independent variables, although adding the interaction term boosts the VIF value of performance measure and remuneration committee dummy.

Table 7.7 examines the influence of the presence of the remuneration committee on pay-performance relation. The dependent variable is the log of total cash compensation of individual executive. Performance is interacted with the remuneration committee dummy in order to explore the moderation effect. Column (1) to (3) report the results when firm performance is measured by ROA, while column (4) to (6) present the empirical findings when stock return is employed. In addition, results shown in column (1) and (4) are gained from the pooled sample OLS regression, column (2) and (5) presents the fixed-effect estimates, and the FE-2SLS estimates are shown in column (3) and (6). Table 7.6 shows that all the models have F-statistics statistically significant at the 0.01 level (i.e. Prob.>F=0.000) so that the models are correctly specified.

Table 7.6
VIF Test: Presence of the Remuneration Committee and Pay-performance Link

Variable Name	VIF	Variable Name	VIF
Panel A			
Committee*ROA	7.11	Tenure	1.39
ROA	6.78	Area Dummy_5	1.39
Year Dummy_2011	2.91	Board Size	1.37
Year Dummy_2008	2.68	Ownership Concentration	1.33
Year Dummy_2010	2.66	Age	1.24
Year Dummy_2009	2.62	Supervisory Board	1.21
Area Dummy_4	2.43	Industry_4	1.14
Hierarchy 1	2.01	Board Independence	1.14
Hierarchy 2	1.97	Industry_3	1.12
Area Dummy_2	1.92	Industry_5	1.12
Year Dummy_2007	1.89	State Owned	1.12
Area Dummy_3	1.72	Industry_2	1.11
Firm Age	1.68	Foreign Ownership	1.09
Volatility	1.62	Leverage	1.07
Area Dummy_6	1.60	Executive Ownership	1.06
Committee Dummy	1.59	Growth Opportunity	1.05
Area Dummy_7	1.52	Female	1.05
Firm Size	1.39	Duality	1.04
	Mean VIF: 1.86		
Panel B			
Committee*Stock Return	8.30	Firm Size	1.39
Stock Return	7.64	Area Dummy_5	1.39
Year Dummy_2011	3.10	Board Size	1.37
Year Dummy_2008	2.92	Ownership Concentration	1.33
Year Dummy_2010	2.72	Age	1.23
Year Dummy_2009	2.69	Supervisory Board	1.21
Area Dummy_4	2.43	Board Independence	1.13
Year Dummy_2007	2.08	Industry_4	1.13
Hierarchy 1	2.01	Industry_3	1.12
Hierarchy 2	1.97	State Owned	1.12
Area Dummy_2	1.93	Industry_5	1.11
Committee Dummy	1.79	Industry_2	1.11
Area Dummy_3	1.72	Foreign Ownership	1.09
Firm Age	1.68	Leverage	1.07
Volatility	1.62	Executive Ownership	1.06
Area Dummy_6	1.60	Growth Opportunity	1.05
Area Dummy_7	1.52	Female	1.05
Tenure	1.39	Duality	1.04
	Mean VIF: 1.95		

Table 7.7
Regression Results:
Presence of the Remuneration Committee and Pay-performance Link

Variable	Dependent Variable: Log(cash)					
	OLS	FE	FE-2SLS	OLS	FE	FE-2SLS
	(1)	(2)	(3)	(5)	(4)	(6)
Committee Dummy	0.140***	0.007	-0.037	0.172***	0.006	-0.068
	(3.26)	(0.30)	(-0.51)	(3.84)	(0.24)	(-0.46)
Committee*ROA	0.793	0.454*	1.762			
	(1.25)	(1.80)	(0.98)			
ROA	2.058***	0.550**	1.249			
	(3.51)	(2.47)	(0.76)			
Committee*Stock Return				0.019	0.015	0.090
				(1.09)	(1.29)	(0.60)
Stock Return				-0.005	-0.018	-0.086
				(-0.32)	(-1.61)	(-0.77)
Hierarchy1	0.617***	0.219***	0.244***	0.639***	0.207***	0.205***
	(17.70)	(5.53)	(5.75)	(17.64)	(5.01)	(4.84)
Hierarchy2	0.284***	0.107***	0.107***	0.298***	0.106***	0.106***
	(10.03)	(3.70)	(3.86)	(10.06)	(3.55)	(3.51)
Age	0.004**	0.046	0.021	0.003	0.057	0.056
	(2.01)	(0.51)	(0.81)	(1.44)	(0.41)	(0.40)
Tenure	0.017***	-0.004	-0.003	0.018***	-0.004	-0.004
	(3.38)	(-0.87)	(-0.60)	(3.31)	(-0.96)	(-0.91)
Female	-0.036			-0.022		
	(-1.01)			(-0.57)		
Executive Ownership	2.981**	3.520	2.230	3.145**	4.107	4.042
	(2.10)	(1.04)	(0.62)	(2.02)	(1.18)	(1.14)
Firm Size	0.260***	0.080***	0.122***	0.279***	0.054**	0.052
	(14.53)	(3.52)	(3.18)	(14.25)	(2.37)	(1.18)
Leverage	-0.139***	-0.098**	-0.136**	-0.218***	-0.072**	-0.072
	(-3.44)	(-2.36)	(-2.03)	(-2.77)	(-2.05)	(-1.13)
Firm Age	-0.000	0.099	0.116***	-0.003	0.093	0.098
	(-0.04)	(1.09)	(4.84)	(-0.58)	(0.67)	(0.70)
Volatility	0.077	0.002	0.026	-0.068	-0.027	-0.062
	(0.36)	(0.02)	(0.23)	(-0.29)	(-0.22)	(-0.28)
Growth Opportunity	-0.000	-0.001	-0.001	0.000	-0.000	-0.001
	(-0.16)	(-0.93)	(-1.16)	(0.10)	(-0.63)	(-0.59)
Duality	0.054	0.024	0.043	0.059	0.016	0.018
	(0.99)	(0.71)	(1.22)	(1.01)	(0.46)	(0.50)
Board Independence	0.170	0.232	0.204	-0.061	0.246	0.250
	(0.53)	(1.11)	(1.01)	(-0.18)	(1.14)	(1.16)
Board Size	0.194**	0.100	0.090	0.171*	0.105	0.104
	(2.10)	(1.41)	(1.36)	(1.74)	(1.40)	(1.41)
Supervisory Board	-0.018	0.058	0.058	-0.034	0.060	0.064
	(-0.22)	(0.89)	(0.88)	(-0.40)	(0.88)	(0.93)
Ownership Concentration	-0.003*	-0.002	-0.001	-0.002	-0.002	-0.002
	(-1.91)	(-1.31)	(-1.21)	(-1.26)	(-1.31)	(-1.30)
State Owned	-0.074*	-0.054	-0.061*	-0.084*	-0.050	-0.047
	(-1.67)	(-1.62)	(-1.88)	(-1.75)	(-1.45)	(-1.29)
Foreign Ownership	0.666***	0.252	0.350*	0.707***	0.199	0.189
	(4.73)	(1.25)	(1.75)	(4.54)	(0.96)	(0.88)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Area Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14919	14919	14919	14919	14919	14919
R^2	0.468	0.483	0.419	0.413	0.467	0.461
Adjusted- R^2	0.466	0.482	0.294	0.411	0.466	0.344
F	75.24***	80.82***	6250.6***	63.58***	75.57***	76.66***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Coefficients of the interaction term Committee*ROA are positive in all three estimation, but only the FE estimator provides a coefficient statistically significant at the 0.1 level. As shown in column (2) in Table 7.6, for executives from firms in which the remuneration committee has established, cash compensation will increase by 172.92 percent (i.e. exp (0.454+0.55)-1) if ROA increase by one unit, while cash compensation of executives in companies without the remuneration committee increases by 73.33 percent (i.e. exp (0.55)-1) for an one-unit growth in ROA. Therefore, the relation of pay and accounting-based performance for companies with the remuneration committee is significantly higher than that in firms without the remuneration committee, holding other controls constant. However, the positive influence of the remuneration committee presence on company performance is not supported when annual stock return is employed.

Table 7.8
VIF Test: Presence of the Remuneration Committee and Equity-based Compensation

Variable Name	VIF	Variable Name	VIF
Year Dummy_2008	3.01	Board Size	1.37
Year Dummy_2010	2.92	Ownership Concentration	1.33
Year Dummy_2011	2.92	Committee Dummy	1.28
Year Dummy_2009	2.72	Age	1.24
Area Dummy_4	2.43	ROA	1.23
Hierarchy 1	2.01	Supervisory Board	1.21
Year Dummy_2007	1.98	Leverage	1.18
Hierarchy 2	1.97	Board Independence	1.14
Area Dummy_2	1.93	Industry_4	1.13
Stock Return	1.87	State Owned	1.12
Area Dummy_3	1.72	Industry_3	1.12
Volatility	1.7	Industry_5	1.12
Firm Age	1.68	Industry_2	1.11
Area Dummy_6	1.61	Foreign Ownership	1.09
Area Dummy_7	1.52	Executive Ownership	1.06
Firm Size	1.43	Female	1.05
Tenure	1.39	Growth Opportunity	1.05
Area Dummy_5	1.39	Duality	1.04
Mean VIF: 1.59			

Table 7.8 tests the VIF value for independent variables involved in estimating the influence of the remuneration committee presence on the likelihood of receiving equity-based compensation. Like exhibited in prior sections, the mean value of VIF is about 1.59, far less than the ceiling limit value 10. Therefore, independent variables in the logit do not suffer from the collinearity problem.

Table 7.9 examines the influence of the remuneration committee existence on the likelihood of receiving equity-based compensation. The dependent variable is the equity-based pay dummy equal to 1 if the executive has been granted equity-based compensation. The propensity of being granted equity-based compensation for executives from companies with the established remuneration committee does not significantly differ from executives at companies without such committees, demonstrated by the non-significant coefficient of the remuneration committee dummy. This is inconsistent with Conyon and He (2012) who observe that CEOs in Chinese listed companies with the remuneration committee are more likely to receive equity-based pay. One potential reason for the difference is that Conyon and He (2012) focus on CEOs only and employ the logit model with robust standard errors, while the current study includes executives across different hierarchies and relies on the logit regression with clustered standard errors to allow for within cluster dependence. When running a logit regression with robust standard errors for CEOs, this study finds that CEOs in companies with the remuneration committee are more likely to receive equity-based compensation, consistent with Conyon and He (2012).

Table 7.9
Regression Results:
Presence of the Remuneration Committee and Equity-based Compensation

Variable	Dependent Variable: Equity-based Pay (Dummy)	
	Odds Ratio	Coefficient
Committee Dummy	1.68	0.52
	(0.87)	(0.87)
Managerial Attribute	Yes	
Firm Characteristics	Yes	
Board Structure	Yes	
Ownership Structure	Yes	
Year Dummies	Yes	
Industry Dummies	Yes	
Area Dummies	Yes	
Constant	-7.73**	
	(-2.46)	
Observations	14919	
Pseudo R^2	0.161	
Adjusted- R^2	0.149	
Chi^2	235.1***	

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

7.3.2 Managerial Power and Compensation Plans

Table 7.10 tests the VIF value for independent variables involved in the regression about the role of managerial power in determining pay level, where managerial power is denoted by the proportion of insiders serving on the remuneration committee and the size of this committee. The mean value of VIF is 1.62, far less than 10, indicating that the regressions do not suffer from the collinearity problem.

Table 7.10
VIF Test: Managerial Power and Compensation Level

Variable Name	VIF	Variable Name	VIF
Year Dummy_2011	3.53	Ownership Concentration	1.31
Year Dummy_2008	3.30	Committee Size	1.29
Year Dummy_2010	3.12	Age	1.23
Year Dummy_2009	3.09	Supervisory Board	1.22
Area Dummy_4	2.40	Committee Insiders	1.21
Year Dummy_2007	2.21	Board Independence	1.15
Hierarchy 1	2.10	Industry_4	1.14
Hierarchy 2	2.04	Industry_3	1.13
Area Dummy_2	1.90	State Owned	1.11
Stock Return	1.82	Industry_5	1.11
Area Dummy_3	1.74	Foreign Ownership	1.11
Firm Age	1.68	Industry_2	1.11
Volatility	1.63	Leverage	1.09
Area Dummy_6	1.58	ROA	1.09
Area Dummy_7	1.51	Executive Ownership	1.06
Board Size	1.47	Female	1.05
Firm Size	1.42	Growth Opportunity	1.05
Area Dummy_5	1.42	Duality	1.04
Tenure	1.36	**Mean VIF:**	**1.62**

Regression results regarding the influence of managerial power on the level of executive cash compensation are reported in Table 7.11. Column (1), (2) and (3) present results obtained from the pooled sample OLS, the fixed-effect and the 2SLS, respectively. Hypothesis 8 and 11 expect a positive relation of managerial power and compensation level. Specifically, hypothesis 8 predicts that the level of executive pay is higher when the proportion of insiders on the remuneration committee is higher, while hypothesis 11 predicts that smaller remuneration committees are associated with higher compensation. However, there is no significant relation between the level of cash compensation and those two variables, as shown in Table 7.11. Therefore, this study finds little evidence to support the positive relation between managerial power and the level of executive pay. This is consistent with

prior studies such as Conyon and He (2004) who also find little evidence for this phenomenon.

Regression results regarding the influence of managerial power on compensation level are reported in Table 7.11. Column (1), (2) and (3) present results obtained from the pooled sample OLS, the fixed-effect and the FE-2SLS, respectively. Hypothesis 8 and 11 expect a positive relation of managerial power and compensation level. Specifically, hypothesis 8 predicts that the level of executive pay is higher when the proportion of insiders on the remuneration committee is higher, while hypothesis 11 predicts that smaller remuneration committee is associated with higher compensation. However, there is no significant relation between the level of cash compensation and those two variables, as shown in Table 7.11. Therefore, this study finds little evidence to support the positive relation between managerial power and the level of executive compensation. This is consistent with prior studies such as Conyon and He (2004) who also find little evidence for this phenomenon.

Table 7.11
Regression Results:
Managerial Power and Compensation Level

Variable	Dependent Variable: Log(cash)		
	OLS	Fixed-effect	FE-2SLS
	(1)	(2)	(3)
Committee Insider	-0.209	-0.030	0.044
	(-1.30)	(-0.22)	(0.29)
Committee Size	0.004	-0.014	-0.012
	(0.21)	(-0.71)	(-0.51)
Hierarchy 1	0.624***	0.218***	0.255***
	(17.20)	(4.82)	(4.47)
Hierarchy 2	0.295***	0.119***	0.122***
	(9.65)	(3.66)	(3.57)
Age	0.004*	0.115***	0.077
	(1.84)	(2.69)	(0.60)
Tenure	0.018***	-0.002	0.003
	(3.59)	(-0.37)	(0.41)
Female	-0.040		
	(-1.11)		
Executive Ownership	3.510***	2.926	2.926
	(2.59)	(0.84)	(0.66)
ROA	2.899***	0.933***	3.505**
	(9.88)	(5.07)	(1.98)
Stock Return	-0.014	-0.010	0.156
	(-1.06)	(-1.42)	(1.00)
Firm Size	0.256***	0.083***	0.227**
	(13.72)	(3.28)	(2.24)
Leverage	-0.112***	-0.062*	-0.208
	(-3.09)	(-1.66)	(-1.44)
Firm Age	0.001	0.030	0.079
	(0.22)	(0.72)	(0.60)
Volatility	0.196	0.013	0.362
	(0.87)	(0.10)	(0.99)
Growth Opportunity	-0.000	-0.001	-0.003
	(-0.19)	(-0.98)	(-1.22)
Duality	0.057	0.009	0.039
	(1.00)	(0.24)	(0.88)
Board Independence	0.134	0.244	0.251
	(0.40)	(1.24)	(1.09)
Board Size	0.138	0.048	0.043
	(1.36)	(0.69)	(0.58)
Supervisory Board	0.003	0.051	0.079
	(0.03)	(0.66)	(0.89)
Ownership Concentration	-0.002*	-0.001	-0.001
	(-1.78)	(-0.39)	(-0.47)
State Owned	-0.070	-0.046	-0.041
	(-1.52)	(-1.36)	(-0.96)
Foreign Ownership	0.713***	0.247	0.467
	(4.83)	(0.97)	(1.52)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
Area Dummies	Yes	Yes	Yes
Observations	12790	12790	12790
R^2	0.460	0.451	0.131
Adjusted- R^2	0.458	0.450	-0.091
F	53.85***	59.64***	50.77***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 7.12 reports the VIF values for independent variables involved in testing the influence of managerial power on pay-performance relation. The mean values of VIF are far less than 10, although adding the interaction significantly increases the VIF value for firm performance variables.

Table 7.12
VIF Test: Managerial Power and Pay-performance Link

Variable Name	VIF	Variable Name	VIF
Panel A			
Insider*ROA	25.53	Board Size	1.47
ROA	23.04	Area Dummy_5	1.43
Size*ROA	17.53	Firm Size	1.42
Year Dummy_2011	3.34	Tenure	1.36
Year Dummy_2010	3.06	Ownership Concentration	1.32
Year Dummy_2008	3.04	Age	1.23
Year Dummy_2009	3.03	Supervisory Board	1.22
Area Dummy_4	2.41	Board Independence	1.15
Hierarchy 1	2.10	Industry_4	1.14
Year Dummy_2007	2.09	Industry_3	1.13
Hierarchy 2	2.04	Foreign Ownership	1.12
Area Dummy_2	1.90	State Owned	1.12
Committee Size	1.89	Industry_5	1.11
Committee Insiders	1.84	Industry_2	1.11
Area Dummy_3	1.75	Leverage	1.07
Firm Age	1.68	Executive Ownership	1.06
Volatility	1.63	Female	1.05
Area Dummy_6	1.58	Duality	1.05
Area Dummy_7	1.50	Growth Opportunity	1.04
	Mean VIF: 3.25		
Panel B			
Stock Return	20.52	Area Dummy_5	1.42
Size*SR	17.25	Firm Size	1.41
Insider*SR	14.36	Tenure	1.36
Year Dummy_2011	3.56	Committee Insiders	1.34
Year Dummy_2008	3.33	Ownership Concentration	1.31
Year Dummy_2010	3.12	Age	1.23
Year Dummy_2009	3.10	Supervisory Board	1.22
Area Dummy_4	2.40	Board Independence	1.15
Year Dummy_2007	2.23	Industry_4	1.13
Hierarchy 1	2.10	Industry_3	1.13
Hierarchy 2	2.04	State Owned	1.11
Area Dummy_2	1.90	Foreign Ownership	1.11
Area Dummy_3	1.74	Industry_5	1.11
Firm Age	1.67	Industry_2	1.10
Volatility	1.63	Leverage	1.07
Area Dummy_6	1.58	Executive Ownership	1.06
Area Dummy_7	1.50	Female	1.05
Board Size	1.48	Growth Opportunity	1.05
Committee Size	1.44	Duality	1.04
	Mean VIF: 2.88		

Hypothesis 9 and 12 relate to the role of managerial power in determining pay structure. The empirical tests of those two hypotheses are reported in Table 7.13. The

dependent variable is the log transformation of cash compensation. Performance variable is interacted with the proportion of insiders on the remuneration committee and the size of the remuneration committee, separately, in order to observe the influence of managerial power on pay-performance link. Estimates of pooled sample OLS, the fixed-effect and the FE-2SLS are presented in column (1), (2) and (3), respectively. Like the estimates shown in previous sections, Table 7.13 shows that all models have F-statistics statistically significant at the 0.01 level (i.e. Prob.>F=0.000), indicating that the models are correctly specified.

Hypothesis 9 predicts that executive compensation is less aligned with company performance when the proportion of insiders on the remuneration committee is higher. This hypothesis is supported by the OLS and fixed-effect estimates shown in column (1) and (2), separately, demonstrated by the significantly negative coefficient of the interaction term Committee Insider*ROA. Specifically, the OLS estimates show that the coefficient of Committee Insider*ROA is -6.937 and statistically significant at the 0.01 level. Economically, the relation of pay and ROA is 481.60 percent when the proportion of insiders on the remuneration committee is 0, and this relation decreases to 231.87 percent (i.e. 4.816-6.937*0.36) when the proportion of insiders increases to 33.33 percent (i.e. the mean value in this sample). When the proportion of insiders on the remuneration committee increases to 1 (i.e. the maximum value in this sample), the relation of pay and ROA even becomes negative (i.e. 4.816-6.937*1). In terms of the fixed-effect approach, the coefficient of Committee Insider*ROA remains to be statistically significant at the 0.01 level, although it reduces to -2.135. However, the phenomenon that the relation of executive compensation and firm performance decreases as the proportion of insiders on the remuneration committee increases is not supported when the FE-2SLS estimator is in use.

Table 7.13
Regression Results:
Managerial Power and Pay-performance Link

Variable	Dependent Variable: Log(cash)					
	OLS	FE	FE-2SLS	OLS	FE	FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
ROA	4.816***	0.226	-8.142			
	(3.83)	(0.27)	(-1.37)			
Committee Insider*ROA	-6.937***	-2.135*	-16.066			
	(-2.77)	(-1.68)	(-1.47)			
Committee Size*ROA	0.158	0.399*	4.695**			
	(0.62)	(1.95)	(2.11)			
Stock Return				-0.021	-0.004	0.232
				(-0.68)	(-0.14)	(0.87)
Committee Insider*SR				0.069	-0.070*	-0.180
				(1.31)	(-1.81)	(-0.54)
Committee Size*SR				0.003	0.008	-0.032
				(0.37)	(1.18)	(-0.46)
Committee Insider	0.050	0.085	0.850	-0.260	-0.002	0.082
	(0.28)	(0.63)	(1.52)	(-1.44)	(-0.01)	(0.43)
Committee Size	-0.003	-0.029	-0.182**	0.008	-0.017	-0.003
	(-0.13)	(-1.41)	(-2.30)	(0.39)	(-0.90)	(-0.08)
Managerial Attribute	Yes	Yes	Yes	Yes	Yes	Yes
Firm Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Board Structure	Yes	Yes	Yes	Yes	Yes	Yes
Ownership Structure	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Area Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12790	12790	12790	12790	12790	12790
R^2	0.462	0.453	0.006	0.399	0.436	0.390
Adjusted- R^2	0.460	0.452	-0.191	0.397	0.435	0.234
F	51.85***	60.58***	41.29***	43.54***	54.77***	51.37***

t statistics in parentheses; * p<0.1, ** p<0.05, *** p<0.01

Based on the managerial power perspective, hypothesis 12 predicts that the positive pay-performance link decreases as the size of the remuneration committee decreases, holding other controls constant. This is supported by the estimates of the FE-2SLS shown in column (3) in Table 7.13, as well as the fixed-effect estimation shown in column (2). In particular, when the 2SLS approach is in use, the coefficient of Committee Size*ROA is positive and statistically significant at the 0.05 level, as shown in column (3). Specifically, when the number of directors serving on the remuneration committee is equal to 12 (i.e. the maximum value in this sample), the correlation of pay and ROA is about 4819.80 percent. Pay-performance link deceases to 12.80 percent when the number of the remuneration committee member reduces to 2 (i.e. the minimum value in this sample). Coefficient of Committee

Size*ROA is still positive in the fixed-effect model, but the significance level reduces to 0.1.

The significant role of managerial power in determining compensation structure is less supported when annual stock return is employed to measure company performance. The coefficient of Committee Insider*SR is only significant when the fixed-effect approach is employed, indicating that the level of compensation and stock-based performance is less aligned when the proportion of insiders on the remuneration committee is higher. However, the size of the remuneration committee does not tend to have significant influence on the relation of the compensation level and company stock return.

The mean value of VIF shown in table 7.14 is 1.62, far less than the upper limit value 10. Therefore, multi-collinearity is not a serious problem among independent variables involved in estimating the influence of managerial power on the propensity of receiving equity-based compensation.

Table 7.14
VIF Test: Managerial Power and Equity-based Compensation

Variable Name	VIF	Variable Name	VIF
Year Dummy_2011	3.53	Ownership Concentration	1.31
Year Dummy_2008	3.3	Committee Size	1.29
Year Dummy_2010	3.12	Age	1.23
Year Dummy_2009	3.09	Supervisory Board	1.22
Area Dummy_4	2.4	Committee Insider	1.21
Year Dummy_2007	2.21	Board Independence	1.15
Hierarchy 1	2.1	Industry_4	1.14
Hierarchy 2	2.04	Industry_3	1.13
Area Dummy_2	1.9	State Owned	1.11
Stock Return	1.82	Industry_5	1.11
Area Dummy_3	1.74	Foreign Ownership	1.11
Firm Age	1.68	Industry_2	1.11
Volatility	1.63	Leverage	1.09
Area Dummy_6	1.58	ROA	1.09
Area Dummy_7	1.51	Executive Ownership	1.06
Board Size	1.47	Female	1.05
Firm Size	1.42	Growth Opportunity	1.05
Area Dummy_5	1.42	Duality	1.04
Tenure	1.36	**Mean VIF:**	**1.62**

Table 7.15
Regression Results: Managerial Power and Equity-based Compensation

Variable	Dependent Variable: Equity-based Pay (Dummy)	
	Coefficient	Odds Ratio
	(1)	(1)
Committee Insider	0.327	1.386
	(0.21)	(0.21)
Committee Size	0.146	1.158
	(1.08)	(1.08)
Hierarchy 1	0.366	1.441
	(1.30)	(1.30)
Hierarchy 2	0.362	1.437
	(1.47)	(1.47)
Age	-0.049***	0.953***
	(-3.55)	(-3.55)
Tenure	0.040	1.040
	(1.26)	(1.26)
Female	-0.307	0.736
	(-1.27)	(-1.27)
Executive Ownership	3.776	43.638
	(0.71)	(0.71)
ROA	6.786***	885.099***
	(5.10)	(5.10)
Stock Return	0.043	1.044
	(0.68)	(0.68)
Firm Size	0.581***	1.788***
	(4.09)	(4.09)
Leverage	-1.202***	0.300***
	(-3.21)	(-3.21)
Firm Age	-0.031	0.969
	(-0.65)	(-0.65)
Volatility	0.022	1.023
	(0.01)	(0.01)
Growth Opportunity	0.009*	1.009*
	(1.87)	(1.87)
Duality	-0.775**	0.461**
	(-2.26)	(-2.26)
Board Independence	-4.708**	0.009**
	(-2.38)	(-2.38)
Board Size	-0.580	0.560
	(-0.82)	(-0.82)
Supervisory Board	-0.867	0.420
	(-1.26)	(-1.26)
Ownership Concentration	-0.058***	0.943***
	(-5.29)	(-5.29)
State Owned	-1.008***	0.365***
	(-2.86)	(-2.86)
Foreign Ownership	-0.844	0.430
	(-0.93)	(-0.93)
Year Dummies	Yes	
Industry Dummies	Yes	
Area Dummies	Yes	
Constant	-7.951***	
	(-2.67)	
Observations	12790	
Pseudo R^2	0.173	
Adjusted- R^2	0.158	
Chi^2	210.9***	

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Hypothesis 10 and 13 relate to the role of managerial power in determining the likelihood of receiving equity-based compensation. Specifically, hypothesis 10 predicts that executives are less likely to receive equity-based compensation when the proportion of insiders on the remuneration committee is higher, and the prediction of hypothesis 13 is that executives are less likely to be granted equity-based compensation when the size of the remuneration committee is smaller. However, the logit regression provides little evidence to support these two hypotheses.

7.4 Conclusion

This chapter reports and discusses the role of the remuneration committee in determining executive compensation settings from both the classic principal-agent perspective and managerial power perspective. First of all, it tests the influence of the remuneration committee presence on the level of pay, pay-performance relation, and the likelihood of receiving equity-based pay, based on principal-agent theory. The empirical results suggest that there is no significant difference in the level of pay between companies with the remuneration committee and companies without such a committee. Similarly, the propensity of receiving equity-based compensation for executives in companies with the remuneration committee does not significantly differ from firms in which the remuneration committee has not established. However, pay is more tied to accounting-based performance when companies have established the remuneration committee.

This chapter also explores the role of managerial power, denoted by the proportion of insiders on the remuneration committee and the size of the remuneration committee, in affecting executive compensation plans. It finds that managerial power plays an important role in determining pay-performance relation, although its impact on the level of compensation and the likelihood of receiving equity-based pay is not significant. Specifically, the level of executive compensation and company accounting-based performance are less aligned when the proportion of insiders on the remuneration committee is higher, and when the number of directors serving on the remuneration committee is smaller.

This chapter together with last two chapters have examined the determinants of executive compensation in Chinese listed companies from the principal-agent, tournament and managerial power perspective. The next chapter aims to explore whether financial incentives indeed motivate executives to boost company performance through testing the causal effect of adopting equity-based compensation on company performance.

Chapter 8: The Causal Effect of Adopting Equity-based Compensation on Company Performance- Empirical Results

"One day Deng Xiaoping decided to take one of his grandsons to visit Mao Tse-tung. "Call me Granduncle," Mao offered warmly. "Oh, I certainly couldn't do that, Chairman Mao," the awe-struck child replied. "Why don't you give him an apple?" suggested Deng. No sooner had Mao done so than the boy took a healthy bite out of it, then happily chirped, "Oh, thank you, Granduncle." "You see," said Deng, "what incentives can achieve."

-Pico Iyer, 1984, "China: Capitalism in the Marketing"[16]

8.1 Introduction

Empirical evidence in relation to the determinants of equity-based compensation has been reported and discussed in the last three chapters. This chapter aims to analyse whether adopting equity-based compensation in Chinese listed companies indeed produces better future performance, as predicted in the principal-agent literature. Empirical results relate to hypothesis 14 show that firm performance is positively related to the adoption of equity-based pay.

The remainder of this chapter is organized as follows. Descriptive statistics and correlation matrix are reported in section 8.2, followed by VIF test and regression results in section 8.3. Section 8.4 provides the conclusion.

[16] Iyer, P. (1984). China: Capitalism in the Marketing. Retrieved 01/06/2012, from http://content.time.com/time/magazine/article/0,9171,951047,00.html

8.2 Descriptive Statistics

Figure 8.1: Adoption of Equity-based Compensation in China, 2006-2011

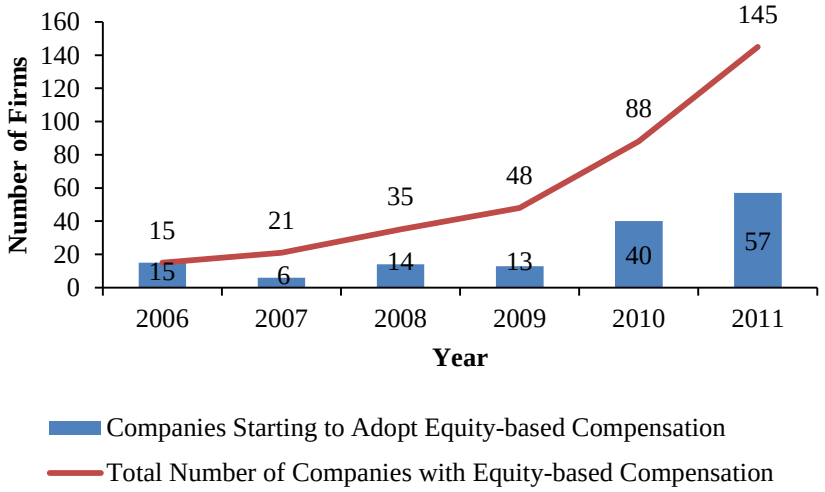


Figure 8.1 presents the annual number of firms starting to offer equity-based pay and the annual total number of firms with equity-based pay for each year during the period 2006-2011. Firms with equity-based pay are limited before 2010, as shown in Figure 8.1. Specifically, 15 companies have adopted equity-based compensation in 2006. On average, there were 10 firms started to offer equity-based compensation for their executives per year between 2007 and 2009. By the end of 2009, total number of firms with equity-based compensation has risen to 48. Number of firms started to adopt equity-based pay significantly increased in 2010 and 2011, according to Figure 8.1. Specifically, there were 40 and 57 firms started to motivate their executives using equity-based compensation in 2010 and 2011, respectively. There have been total 147 companies in which equity-based pay has put into practice, by the end of 2011.

Table 8.1 reports the mean value of financial variables and corporate governance characteristic for control group and treatment group, respectively. As shown in table 3, the size of firms in the treatment group is relatively larger than firm size in the control group, but the growth opportunity is relatively smaller in the treatment group. In addition, the treatment group has lower ownership concentration and is less state controlled, but has relatively higher executive ownership.

Table 8.1
Descriptive Statistics: Economic and Corporate Governance Characteristics

Variable	Control Group	Treatment Group
	Mean	Mean
ROA (%)	4%	6%
Stock Return (%)	75%	65%
Firm Size (000s Yuan)	6,610,000	1,390,000
Firm Age	12.78	12.09
Leverage	.51	.52
Growth Opportunity	3.06	2.63
State Owned Dummy	.08	.04
Executive Ownership (%)	0.3%	0.8%
Ownership Concentration	.15	.13
Duality Dummy	.85	.84
Board Independence (%)	35%	35%
Number of Supervisors	3.64	3.71
Observations	700	82

Table 8.2 presents the correlation matrix for the key variables in this study. Table 4 shows that the treated dummy (i.e. the adoption of equity-based compensation) is positively related to the percentage of equity incentive and firm size. In addition, ROA is positively related to firm size but negatively related to leverage. Annualized stock return has negative relationship with both the firm size and state ownership. However, it is positively related to firm growth opportunities.

Table 8.2
Correlation Matrix

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.	Treated	1													
2.	ROA	0.05	1												
3.	Stock Return	-0.03	-0.05	1											
4.	Equity	0.75***	0.05	-0.02	1										
5.	Firm Size	0.09*	0.09*	-0.11**	-0.03	1									
6.	Firm Age	-0.06	-0.05	-0.06	-0.11**	0.28***	1								
7.	Leverage	0.02	-0.27***	0.02	-0.02	0.34***	0.21***	1							
8.	Growth Opportunity	-0.01	-0.05	0.13***	-0.01	-0.09*	0.00	-0.00	1						
9.	State Owned	-0.05	-0.01	-0.10**	-0.07*	0.04	-0.12***	-0.01	-0.04	1					
10.	Executive Ownership	0.06	0.02	0.03	0.08*	-0.02	-0.07	-0.04	0.00	-0.04	1				
11.	Ownership Concentration	-0.02	0.05	-0.07	-0.06	0.13***	-0.36***	0.02	-0.05	0.38***	-0.05	1			
12.	Duality	-0.01	-0.04	0.01	-0.02	0.12***	0.03	0.18***	-0.00	0.04	-0.01	0.10**	1		
13.	Board Independence	-0.01	-0.01	-0.06	-0.03	0.08*	0.14***	0.05	0.06	-0.07	-0.01	-0.17***	-0.08*	1	
14.	Supervisory Board	0.02	0.05	-0.01	-0.02	0.16***	0.01	-0.05	-0.03	0.16***	-0.06	0.06	0.05	-0.05	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Explanation of the variables are presented in table 4.3 in chapter 4.

8.3 Regression Results

Table 8.3 reports the VIF test for independent variables involved in testing the causal effect of adopting equity-based pay on company performance. Table 8.3 shows that the mean value of VIF is 1.72, far less than the upper value 10, indicating that independent variables do not suffer from potential collinearity problems.

Table 8.3
VIF Test: Adopting Equity-based Pay and Company Performance

Variable Name	VIF	Variable Name	VIF
Year Dummy_2011	3.56	Firm Size	1.58
Year Dummy_2009	3.13	Industry_4	1.34
Year Dummy_2007	2.78	Industry_3	1.33
Treated*After	2.12	Leverage	1.23
Treated	2.03	Industry_5	1.22
Year Dummy_2010	1.92	Industry_2	1.18
After	1.91	Board Independence	1.12
Ownership Concentration	1.89	Supervisory Board	1.12
Firm Age	1.88	Duality	1.10
State Owned	1.80	Growth Opportunity	1.04
Year Dummy_2008	1.76	Executive Ownership	1.04
Year Dummy_2006	1.58	**Mean VIF**	1.72

Table 8.4 presents the results from the difference-in-difference (DID) estimation when firm performance is measured by ROA and annual stock return, respectively. Standard errors are clustered by firms to allow for non-independence. It considers a window from one year before to one year after the adoption of equity-based compensation, while the year of adopting equity-based compensation is omitted from the estimation to control for the endogeneity of compensation.

The coefficient of the interaction term *Treated*After* measures the difference between treated firms and control firms after the adoption of equity-based compensation, and it is the main coefficient of interest in this study. It can be seen from Table 8.4 that the coefficient of the interaction term *Treated*After* is always positive and statistically significant at the .1 level (i.e. $p<0.1$) when company performance is measured by ROA, suggesting that the adoption of equity-based compensation improves firm accounting-based performance. Specifically, the column (5) of Table 8.4 shows that ROA of firms with equity-based compensation is 2.1 percent higher than that of firms without equity-based compensation, one year after adopting equity incentives. It is worth noting that R-square significant increases from 1.6 percent shown in column (2) to 12.3 percent shown in column (3) after adding firm financial characteristics, suggesting that those

financial variables have strong predicting power for firm performance. In particular, firm size has a significantly positive effect on firm performance, while the influence of leverage on company accounting-based performance is significant and negative. However, corporate governance mechanisms do not tend to significantly influence firm performance. This might be because the little change of corporate governance structure in the short term.

However, Table 8.5 shows that the coefficient of the interaction term *Treated*After* is not significant when performance is measured by annual stock return, indicating that there is not any significant difference between treated firms and control firms after adopting equity-based compensation. One interpretation for this might be that the practitioners normally use the accounting-based performance measure when setting exercise conditions for equity-based compensation. Goergen and Renneboog (2011) argue that equity-based compensation only plays the incentive role in increasing firm performance when the granting of those equities depends on a relevant firm performance criterion.

Table 8.4
Regression Results: The Causal Effect of Adopting Equity-based Compensation on Company Performance (ROA)

Variable	Dependent Variable: ROA				
	(1)	(2)	(3)	(4)	(5)
Treated	0.007	0.007	0.003	0.003	0.002
	(1.33)	(1.37)	(0.49)	(0.43)	(0.39)
After	-0.013	-0.017	-0.017	-0.016	-0.017
	(-1.48)	(-1.33)	(-1.50)	(-1.42)	(-1.42)
Treated* After	0.025*	0.025*	0.020*	0.020*	0.021*
	(1.85)	(1.86)	(1.72)	(1.72)	(1.71)
Firm Size			0.022***	0.021***	0.021***
			(3.47)	(3.38)	(3.12)
Firm Age			-0.008	-0.007	-0.007
			(-0.91)	(-0.71)	(-0.68)
Leverage			-0.196***	-0.196***	-0.195***
			(-4.91)	(-4.92)	(-4.77)
Growth Opportunity			-0.000	-0.000	-0.000
			(-0.37)	(-0.36)	(-0.36)
State Owned Dummy				-0.006	-0.007
				(-0.41)	(-0.43)
Executive Ownership				0.064	0.066
				(0.53)	(0.54)
Ownership Concentration				0.007	0.010
				(0.27)	(0.36)
Duality					-0.004
					(-0.50)
Board Independence					0.017
					(0.26)
Supervisory Board					0.002
					(0.13)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.049***	0.051***	-0.296**	-0.297**	-0.303**
	(14.63)	(9.20)	(-2.56)	(-2.52)	(-2.50)
Observations	782	782	782	782	782
R^2	0.005	0.016	0.123	0.123	0.123
Adjusted- R^2	0.001	0.000	0.104	0.100	0.097
F	2.102*	1.740**	4.736***	4.025***	3.559***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Note: treated is a dummy variable equal to 1 if the company belongs to the treatment group (i.e. companies with equity-based compensation), and 0 otherwise; after is a dummy variable equal to 1 if it is in the period one year after adopting equity-based compensation, and 0 otherwise; Treated* After is the interaction term. Explanations of all the other variables are shown in table 4.3 in chapter 4.

Table 8.5
Regression Results: The Causal Effect of Adopting Equity-based Compensation on Company Performance (Stock Return)

Variable	Dependent Variable: Stock Return				
	(1)	(2)	(3)	(4)	(5)
Treated	-0.056	-0.002	0.025	0.035	0.040
	(-0.30)	(-0.01)	(0.22)	(0.31)	(0.35)
After	0.082	0.029	0.030	0.022	0.029
	(0.91)	(0.37)	(0.37)	(0.27)	(0.35)
Treated* After	-0.092	-0.189	-0.183	-0.185	-0.193
	(-0.34)	(-0.98)	(-0.96)	(-0.96)	(-1.00)
Firm Size			-0.048*	-0.058**	-0.063**
			(-1.70)	(-2.00)	(-2.10)
Firm Age			0.204**	0.242**	0.231**
			(2.13)	(2.37)	(2.24)
Leverage			0.334**	0.332**	0.315**
			(2.35)	(2.34)	(2.22)
Growth Opportunity			0.007***	0.007***	0.007***
			(3.63)	(3.64)	(3.67)
State Owned				-0.043	-0.041
				(-0.46)	(-0.44)
Executive Ownership				-0.440	-0.438
				(-0.78)	(-0.83)
Ownership Concentration				0.393*	0.345
				(1.79)	(1.57)
Duality					0.135*
					(1.78)
Board Independence					-0.437
					(-1.06)
Supervisory Board					0.075
					(0.51)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.705***	-0.163***	0.266	0.342	0.386
	(12.06)	(-4.42)	(0.43)	(0.56)	(0.63)
Observations	782	782	782	782	782
R^2	0.002	0.603	0.614	0.615	0.617
Adjusted- R^2	-0.002	0.596	0.605	0.605	0.605
F	0.490	148.2***	119.5***	111.1***	99.97***

t statistics in parentheses; * $p<0.1$, ** $p<0.05$, *** $p<0.01$
Note: treated is a dummy variable equal to 1 if the company belongs to the treatment group (i.e. companies with equity-based compensation), and 0 otherwise; after is a dummy variable equal to 1 if it is in the period one year after adopting equity-based compensation, and 0 otherwise; Treated* After is the interaction term. Explanations of all the other variables are shown in table 4.3 in chapter 4.

8.4 Conclusion

Based on matched sample using the propensity score matching (PSM), this chapter empirically examines whether adopting equity-based compensation delivers better future firm performance in China using difference-in-difference (DID) estimator. Empirical results suggest the adoption of equity-based compensation does positively affect firm accounting-based performance in China, but is not effective in improving stock-based performance. Therefore, hypothesis 14 that adopting equity-based pay results in firm performance improvements is partly supported.

Chapter 9: Conclusions

"Our goal is for executive compensation to be well aligned with stockholders' interests, and the company is firm in its commitment to using executive compensation programs that are equitable and closely connected to the company's performance".

- Intel Corporation, 2014[17]

9.1 Introduction

Executive compensation has long been a controversial topic which captures much attention of both scholars and practitioners. In particular, more attention has been paid to the structure of pay not just the amount of pay (e.g. Yermack, 1995; Jensen & Murphy, 2010). Most studies on executive compensation rely on the standard principal-agent theory, although some literature has attempted to supplement this theory with insights gained from other theories. Among these studies, a small amount of them is in the context of regions outside developed countries. This study aims to provide a more comprehensive understanding of the determinants of executive compensation in China, one of the largest emerging markets in the world, by supplementing the classical principal-agent theory with insights gained from the tournament theory and the managerial power theory, and to test whether adopting equity-based compensation following the example of western countries leads to better future firm performance in China.

Specifically, the following related questions have been addressed. First of all, has executive compensation been positively tied to company performance in China, as predicted in principal-agent literature? Moreover (and secondly), how does executive position hierarchy influence pay level, pay-performance link and the adoption of equity-based compensation in Chinese listed firms? Thirdly, how does managerial power, represented by remuneration committee size and the proportion of insiders serving on remuneration committee, influence pay level, pay-performance link, and the adoption of equity-based compensation for executives in Chinese listed companies? Finally, does the adoption of equity-based compensation lead to better firm performance in China?

[17] A letter to shareholders provided by Intel Corporation on February 3, 2014. Available at http://www.sec.gov/Archives/edgar/data/50863/000005086314000016/exh991.htm

9.2 Summary of Contributions

As noted in Chapter 1, this study contributes to the executive compensation literature from different aspects. The first contribution of this study is that it examines the executive compensation in emerging markets, in order to explore whether the theories and practices of executive pay in emerging markets are in line with developed countries. In particular, this study chooses samples from China, one of the largest emerging markets in the world, due to China's unique corporate governance and the evolution of executive compensation during the economic reform in the past decades.

In addition, this study differs from previous literature by supplementing the classic principal-agent theory with knowledge gained from the tournament theory and the managerial power theory, in order to provide a more comprehensive view of the determinants of executive compensation in Chinese listed firms. In addition to the positive and significant link between executive pay and company accounting-based performance, empirical findings also support that executive pay practices in China are significantly influenced by executive position hierarchy and managerial power.

Thirdly, this study provides a novel contribution to the compensation literature by testing the influence of remuneration committee size and the proportion of insiders serving on the remuneration committee on executive compensation practice in the context of China from the managerial power perspective. To be specific, in this study, the influences of managerial power on pay settings are considered to be higher if the proportion of independent directors serving on remuneration committee is higher, and if the size of remuneration committee is larger.

Moreover, this study involves equity-based compensation which has been omitted by most prior literature in the context of China except Conyon and He (2012) who estimate the effects of corporate governance mechanisms on the likelihood of being granted equity-based pay for CEOs in Chinese listed companies. This study differs from Conyon and He (2012) by empirically focusing on the role of position hierarchy and managerial power in determining the propensity of receiving equity-based compensation for executives in Chinese listed firms.

In addition to the determinants of equity-based compensation, this study also makes a novel contribution through combining the propensity score matching with the

difference-in-difference regression to test whether adopting equity-based pay produces better firm performance in China.

Sixthly, the improved pay disclosure system after 2005 enables this study to use data of individual executives. Most prior Chinese literature normally measures executive compensation as the pay of the highest-paid executive or the average pay of the top three highest-paid executives, due to data limitation. However, these approaches might result in biased estimation as they are not able to control for the potential influence of individual managerial attributes on compensation (Conyon & He, 2012), especially when those highest paid executives change yearly (Conyon & Sadler, 2001)

Furthermore, the sample included in this study consists of both the CEOs and non-CEO executives. Including non-CEO executives have two advantages. On one hand, it enables this study to provide a more comprehensive view of compensation for the executive team. On the other hand, it allows this study to test the variation of pay practices within the executive team. To my best knowledge, this is the first study on the variation of pay structure across executive position hierarchies within Chinese listed firms.

Finally, the potential endogeneity problem caused by the two-way causality of pay and performance is normally ignored by prior compensation literature. This study contributes to the literature by employing valid instrumental variables and the two-stage least squares estimator to address the endogeneity of pay and performance.

9.3 Summary of Key Findings

As has been noted, one of the objectives of this study is to explore the determinants of executive pay in emerging markets by developing hypotheses from classical principal-agent, tournament and managerial power perspective and by selecting samples from Chinese listed companies. It also examines whether financial incentives indeed motivate executives to improve firm performance, as predicted in agency literature. In general, empirical findings suggest that company performance together with promotion opportunities for executives, the presence of remuneration committee and its size and composition play important roles in determining executive compensation in Chinese listed firms. In addition, company accounting-based performance is improved one year after adopting equity-based compensation. Hypotheses developed in Chapter 4 and empirical findings are summarised in Table 9.1.

Table 9.1 List of Hypotheses and Empirical Findings

Hypothesis	Theory	Empirical Findings
1: Holding other controls constant, the level of executive compensation is positively related to firm performance	Principal-agent	Supported, ROA
2: Holding other controls constant, the level of executive compensation is lower in companies with the remuneration committee	Principal-agent	Not supported, significantly positive
3: Holding other controls constant, executive compensation and firm performance are more aligned in companies with the remuneration committee	Principal-agent	Supported, ROA
4: Holding other controls constant, executives are more likely to receive equity-based compensation in companies with the remuneration committee	Principal-agent	Not supported, no significant relation
5: Holding other controls constant, the level of executive compensation is an increasing function of hierarchical level	Tournament	Supported
6: Holding other controls constant, the level of executive compensation and company performance are more aligned at the higher hierarchical level	Tournament	Supported, ROA
7: Holding other controls constant, executives at the higher hierarchical level are more likely to receive equity-based compensation	Tournament	Not supported, no significant relation
8: Holding other controls constant, the level of executive compensation is positively influenced by the proportion of insiders on the remuneration committee	Managerial Power	Not supported, no significant relation
9: Holding other controls constant, the level of executive compensation and company performance are less aligned when the proportion of insiders on the remuneration committee is higher	Managerial Power	Supported, ROA

Table 9.1 List of Hypotheses and Empirical Findings (Continued)

Hypothesis	Theory	Empirical Findings
10: Holding other controls constant, executives are less likely to receive equity-based compensation when the proportion of insiders on the remuneration committee is higher	Managerial Power	Not supported, no significant relation
11: Holding other controls constant, the level of executive compensation is negatively influenced by the size of remuneration committee	Managerial Power	Not supported, no significant relation
12: Holding other controls constant, the level of executive compensation and company performance are less aligned when the remuneration committee is smaller	Managerial Power	Supported, ROA
13: Holding other controls constant, executives are less likely to receive equity-based compensation when the remuneration committee is smaller	Managerial Power	Not supported, no significant relation
14: Holding other controls constant, adopting equity-based compensation delivers better future financial performance of the firm	Principal-agent	Supported, ROA

The first question in this study is about the relation of pay level and company performance. Based on the principal-agent theory, hypothesis 1 predicts that the level of executive compensation is positively related to firm performance, holding other controls constant. Empirical results reported in Chapter 5 suggest that pay level is positively related to accounting-based performance in Chinese listed companies. However, there is no significant relation between executive cash compensation and company annual stock return. Consequently, it can be conclude that executive compensation is more robustly linked to accounting-based performance rather than stock-based performance in Chinese listed companies.

The second sets of questions relate to the role of hierarchical levels in determining executive compensation. Specifically, the following three questions are addressed:

1. What is the relation of compensation level and hierarchical level?
2. How does pay-performance link vary with hierarchical levels?
3. How does the likelihood of receiving equity-based compensation vary with hierarchical levels?

These questions relate to hypotheses 5 to 7 shown in Table 9.1. Based on tournament theory, hypothesis 5 predicts that the level of pay is an increasing function of executive hierarchical level, holding other controls constant. This is supported by the empirical finding shown in Chapter 6. Empirical results also indicate that the relationship between pay level and position hierarchy tends to be convex in Chinese listed companies. Hypothesis 6 predicts that the positive pay-performance link increases as position hierarchy increases, holding other control variables constant. Empirical results suggest that the link of pay and accounting-based performance is getting greater as moving up the hierarchical levels within Chinese listed companies, but the relation of pay and stock return does not significantly differ between hierarchical levels. Hypothesis 7 predicts that executives at higher position hierarchy are more likely to receive equity-based pay. However, this hypothesis is not supported in this study as empirical results show that hierarchical level does not significantly increase the likelihood of receiving equity-based pay.

The third set of questions concerning the role of the remuneration committee in determining executive compensation settings. On one hand, this study generates questions in relation to the influence of remuneration committee presence on the level

of pay, pay-performance and the likelihood of receiving equity-based pay, based on principal-agent theory. Hypothesis 2 predicts that the level of pay is lower in companies with a remuneration committee holding other controls constant. However, this hypothesis is not supported since empirical results shown in Chapter 7 suggest that the level of executive compensation in companies with a remuneration committee does not significantly differ from companies without such a committee. Hypothesis 4 predicts that executive compensation and company performance are more aligned in firms with a remuneration committee. This is empirically supported. Specifically, pay is more tied to accounting-based performance when firms have established a remuneration committee, although this phenomenon is not supported when firm performance is measured by annual stock return. Hypothesis 5 predicts that executives are more likely to receive equity-based compensation in firms with a remuneration committee, comparing with companies in which the remuneration committee has not established. This hypothesis is also not supported as results show that there is no significant difference in the propensity of receiving equity-based compensation between those two types of companies.

On the other hand, from the managerial power perspective, this study develops hypotheses relative to the role of size and composition of remuneration committee in determining pay level, pay-performance relation and the propensity of receiving equity-based pay. Hypotheses 8 and 11 predict that the level of executive compensation is positively related to the proportion of insiders on the remuneration committee, and negatively related to the size of remuneration committee. However, these hypotheses are not supported and there is little evidence that executives are rewarded excessive amounts of compensation when the proportion of insiders on remuneration committee is high, and when the size of remuneration committee is small. In addition, hypotheses 10 and 12 predict that pay and performance are less aligned when the proportion of insiders on the remuneration committee is high, and when the size of remuneration committee is small. These hypotheses are empirically supported when accounting-based performance is in use. Finally, hypotheses 11 and 13 predict that the likelihood of receiving equity-based compensation is negatively related to the proportion of insiders on remuneration committee, and positively related to the size of remuneration committee. However, this study finds little empirical evidence to support these phenomena. Consequently, remuneration committee tends to be subject to the influence of managerial power to set

a pay structure favourable to executives, although it does not appear to have a tendency on executives' part to compensate large amounts of cash.

The final question in this study relates to the performance consequences of adopting equity-based pay in China. Based on principal-agent theory, hypothesis 14 predicts that firm performance is positively related to the adoption of equity-based pay. Empirical evidence suggests that the accounting performance of Chinese listed firms is significantly improved one year after adopting equity-based compensation.

9.4 Implications

The empirical findings summarised in this last section provide several important academic and practical implications.

9.4.1 Theoretical and Academic Implications

The empirical findings suggest that the level of executive compensation is determined by company performance together with executive promotion opportunities within Chinese listed companies. In addition, the presence of a remuneration committee and its size and composition play important roles in determining executive pay structure in Chinese listed firms. Therefore, the classical principal-agent theory should be supplemented with insights gained from tournament theory and managerial power approach in order to provide a comprehensive view of the determinants of executive compensation in the context of China.

The significant influence of hierarchical level on pay level suggests that executive position hierarchy is an important explanatory variable. Therefore, prior literature using average compensation of the top three highest-paid executives as the dependent variable without controlling for the effects of position hierarchy may provide biased estimates.

9.4.2 Policy and Practical Implications

This study offers some implications which are of importance for policy makers, the board of directors, remuneration committee and other practitioners who are interested in executive pay practices. First of all, this study finds that executive compensation has been positively linked to company performance in China, but the level of pay is more robustly linked to accounting-based performance rather than annual stock return. Therefore, the board of directors and its remuneration committee in Chinese listed

companies should take account of stock-based performance when setting compensation contracts for executives.

In addition, as mentioned earlier, as argued by Gibbs (1995), within-job pay for performance should vary individualistically with differences in promotion opportunities. Specifically, to compensate for the lost promotion opportunities at higher hierarchical levels, compensation needs to be tied more closely to company performance (i.e. greater financial incentives) to provide an incentive for effort (Ortín-Angel & Salas-Fumás, 1998; Conyon & Sadler, 2001; Boschmans, 2008).

Thirdly, this study observes that the level of executive compensation and company performance are more aligned in Chinese companies with a remuneration committee. This result supports calls for the established remuneration committee by the CSRC. As establishing a remuneration committee is not compulsory for Chinese listed firms, policy makers may need to follow developed countries to implement legal compulsion for constructing a remuneration committee through enacting laws.

Moreover, as mentioned earlier, the empirical evidence that compensation and company performance are less aligned when the proportion of insiders on the remuneration committee is larger, and when the size of remuneration committee is smaller suggests that pay settings are more favourable to executives when the remuneration committee are subject to the influence of managerial power in Chinese listed companies. This conclusion provides useful information for the board of directors to take account of the appropriate proportion of insiders and total number of members serving on the remuneration committee, in order to alleviate the influence of managerial power on pay practices. Although the "*Code of Corporate Governance*" advocates Chinese listed companies to establish a remuneration committee in which independent directors shall constitute the majority, this has not been legally supported by the current "*Company Law*". In addition, both the "*Code of Corporate Governance*" and the "*Company Law*" do not provide a clear requirement for the number of members on the remuneration committee. Therefore, policy makers may need to improve the "*Company Law*" to provide a clear and strong legal support for the appropriate composition and size of the remuneration committee. In addition, Chinese listed companies should pay more attention to the decision-making processes of their remuneration committees.

Furthermore, the adoption of equity-based compensation has just formally started in China after 2005 and its implementation is far from prevalent. This study has observed that Chinese listed companies tend to benefit from adopting equity-based compensation as firm accounting-based performance could be effectively improved one year after adopting equity-based compensation. In addition, literature in the context of developed countries has suggested including appropriate proportion of equity incentives in executive compensation portfolios could better motivate executives to work for the best interests of shareholders (e.g. Mehran, 1995; Frye, 2004). Therefore, the board of directors need to take account of the use of equity-based compensation when designing executive compensation contracts. Policy makers in China and perhaps other emerging markets need to introduce more regulations to guide and encourage listed firms to adopt equity-based compensation in order to motivate executives to act for the best interests of shareholders in a better way.

Finally, the disclosure of executive compensation is still lack of transparency in China, although the CSRC has issued the "*Regulations on Listed Companies' Information Disclosure*" in 2007 to further improve the disclosure system. In practice, Chinese listed companies are only required to disclose the total amount of cash compensation for an individual executive rather than each component in executive compensation package. In terms of equity-based compensation, firms only need to disclose its type and implementation in the fiscal year. The lack of transparency creates difficulties for studies on executive compensation in China and may also mislead shareholders' understanding of the compensation process. Consequently, policy makers need to strengthen the compensation disclosure in China further, in order to increase the transparency of the compensation process at Chinese listed companies, to force the board of directors to monitor executives more effectively, and to prevent executives from self-seeking through setting their own pay (Faulkender & Yang, 2012).

9.5 Potential Limitations

Although this study has identified research gaps via reviewing a wide range of literature, attempted to fill up these research gaps by developing a set of hypotheses based on multiple theories and trying to use the most appropriate research methods, and provided some informative empirical findings and important academic and practical implications, there is no doubt that there are potential limitations in this study. This section aims to

outline some potential limitations in this study from different angles, and to provide recommendations for future research.

9.5.1 Theoretical Limitations

One of the potential limitations in this study is the theoretical limitation. Although this study has attempted to provide a more comprehensive view of the determinants of executive compensation in China by supplementing the classical principal-agent theory with insights gained from the tournament theory and the managerial power theory, there are some influential theories in the fields of executive compensation in which this study has not taken into account. For instance, as a typical sociological perspective, the stewardship theory differs from the above three theories by assuming that executives are good stewards. These stewards can operate and work closely with the principal to achieve a 'goal alignment' (Davis, Schoorman, & Donaldson, 1997). As managers are trustworthy and work diligently to achieve high corporate profit and shareholders' returns (Donaldson & Davis, 1991; Donaldson & Davis, 1994), incentive pay is not believed to drive motivation and flat compensation packages is expected (Andreas et al., 2012). The weak relation between executive pay and stock-based performance that has been found in this study calls for future research to analyse executive compensation in China from the stewardship perspective.

9.5.2 Methodological Limitations

There are also some potential limitations in methodology. First of all, the weak information disclosure system only allows this study to measure the level of pay as the reported total cash compensation including basic salary, bonus, and stipends. However, like most prior literature in the context of China (e.g. Firth et al., 2006; Conyon & He, 2012), it excludes the value of equity-based compensation and other deferred compensation due to the data limitation. In addition, as just mentioned, the data limitation does not allow this study to calculate the value of equity-based compensation so that it could only employs a dummy variable to measure the adoption of equity-based compensation. The weak relation of pay and stock-based performance may potentially result from the exclusion of the value of equity-based compensation. Future study may attempt to estimate the pay-performance sensitivity in China using more comprehensive measure of compensation if data is available. However, this calls for further improved disclosure requirements for Chinese listed companies.

In addition, as equity-based incentives have just been introduced after 2005 and is far from prevalent in China, the sample size is very small when estimating the causal effects of adopting equity-based compensation on firm performance. In addition, this study only tests the performance consequences one year after adopting equity-based compensation as it only has performance data by the end of 2011 so that estimating long term performance consequences will make the sample size even smaller. Therefore, future research may attempt to test long term performance consequences by extending the sample period.

Moreover, this study relies on a quantitative method and takes advantage of secondary data to empirically examine the determinants of executive compensation in China. However, as both quantitative and qualitative methods have their own strengths and weaknesses in data collection and analysis procedures (Smith, 1975; Saunders et al., 2009), future research may contribute to the executive compensation literature by combining a quantitative method with a qualitative method. For instance, future research can construct interviews with executives, the board of directors, policy makers and other practitioners to identify the most important issues on compensation, and then empirically examine these issues.

9.6 Recommendations for Future Research

This study also provides the following recommendations for future research. First of all, "shareholder theory" and "stakeholder theory" are two major streams in the fields of corporate governance. The former is based on extensively studied principal-agency relationships and develops a series of well-defined incentive and control mechanisms to protect shareholders against expropriation by managers, and the latter treats corporate governance in a broader context through considering the interests of other stakeholders (e.g. employees and communities) and encourages companies to undertake more social responsibilities (Kang et al, 2008). This study concerns the protection of shareholder interests and focuses on the financial incentives for the executives in China. However, Chinese government and companies are paying increasing attention to corporate social responsibility in order to maintain a sustainable economic development and to enhance their competitiveness in the global market. Future research may examine the relation of corporate governance and social responsibility from the stakeholder perspective.

Another interesting topic is the role of compensation consultants in pay practices. As the expert on remuneration committee, the role of compensation consultants includes making professional recommendations on appropriate pay levels and designing incentive pay packages which can effectively optimise shareholder interests (Murphy & Sandino, 2010). However, their roles are controversial among prior literature in the context of western countries. On one hand, researchers have found that compensation consultants play effective roles in setting executive compensation (e.g. Voulgaris, Stathopoulos, & Walker, 2010). On the other hand, some scholars argue that compensation consultants do not effectively perform their duties. For instance, they may be influenced by the managerial power to set pay contracts to benefit executives at the expense of shareholders (e.g. Bebchuk & Fried, 2003). The "*Code of Corporate Governance*" in China suggests that "each specialised committee may engage intermediary institutions to provide professional opinions" and some Chinese listed companies have reported the use of experts on the remuneration committee. Therefore, for future research, it is worth testing the role of compensation consultants in pay practices in China.

Furthermore, as mentioned earlier, this study finds that there are a small number of executives who are not paid by the current company. Instead, they are paid by controlling shareholders, controlling shareholders' other subsidiaries or the current listed firms' subsidiaries. It is of interest for future research to investigate this group of executives and their companies as those executives may not have effective financial incentive to improve performance of current listed firms in which they are holding positions.

Finally, this study focuses on executive compensation in the context of China. Although China is following developed countries to improving corporate governance, Chinese listed companies still differ from developed countries in terms of ownership structure and pay settings. For example, in contrast to the U.K. where institutional ownership is large (Goergen & Renneboog, 2001), large state ownership is widespread in China (Allen et al., 2005). In addition, a number of Chinese listed firms have dominant shareholders with measurable power and influence over the firm through their large share ownership, while the U.S. companies normally have more diffuse ownership (Conyon & He, 2011). In terms of pay practices, executives in Chinese listed companies receive few equity-based pay compared to the U.S. and European countries (Conyon & He, 2012). Consequently, the big differences in pay practices and ownership structure

encourage future research to deeply compare pay settings in China with other emerging markets and developed countries, in order to generate more global implications.

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Appendices

Appendix A

Matching in 2005

Covariates	Before Matching			After Matching		
	Treated (mean)	Untreated (mean)	P-value for Difference	Treated (mean)	Untreated (mean)	P-value for Difference
Firm Size	21.03	21.23	0.456	21.03	20.98	0.847
Firm Age	2.13	2.25	0.208	2.13	2.19	0.652
Leverage	0.48	0.59	0.742	0.48	0.47	0.859
Growth Opportunity	0.84	0.78	0.927	0.84	1.09	0.717
State Owned	0.07	0.37	0.017**	0.07	0.10	0.682
Executive Ownership	0.00	0.00	0.928	0.00	0.00	0.358
Duality Dummy	0.80	0.88	0.315	0.80	0.86	0.551
Board Independence	0.33	0.35	0.174	0.33	0.33	0.983
Supervisory Board	1.54	1.61	0.298	1.54	1.51	0.634
Ownership Concentration	0.14	0.22	0.028**	0.14	0.15	0.666
Manufactory	0.67	0.58	0.496	0.67	0.58	0.538
Public Service	0.07	0.09	0.779	0.07	0.08	0.825
Real Estate	0.13	0.09	0.522	0.13	0.17	0.743
Conglomerate	0.07	0.16	0.324	0.07	0.08	0.825
Commerce	0.07	0.09	0.787	0.07	0.08	0.825

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Matching in 2006

Covariates	Before Matching			After Matching		
	Treated (mean)	Untreated (mean)	P-value for Difference	Treated (mean)	Untreated (mean)	P-value for Difference
Firm Size	22.44	21.30	0.135	22.44	22.05	0.748
Firm Age	1.99	2.36	0.112	1.99	2.28	0.145
Leverage	0.55	0.60	0.962	0.55	0.59	0.757
Growth Opportunity	0.45	0.78	0.983	0.45	1.17	0.210
State Owned	0.50	0.25	0.405	0.50	0.85	0.227
Executive Ownership	0.00	0.00	0.889	0.00	0.00	1
Duality Dummy	1.00	0.88	0.595	1.00	1.00	1
Board Independence	0.33	0.35	0.563	0.33	0.34	0.804
Supervisory Board	1.84	1.60	0.162	1.84	1.62	0.314
Ownership Concentration	0.52	0.17	0.000***	0.52	0.43	0.230
Manufactory	0.50	0.58	0.820	0.50	0.75	0.465
Public Service	0.00	0.09	0.662	0.00	0.00	1
Real Estate	0.50	0.09	0.038**	0.50	0.25	0.465
Conglomerate	0.00	0.16	0.537	0.00	0.00	1
Commerce	0.00	0.09	0.664	0.00	0.00	1

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Matching in 2007

Covariates	Before Matching			After Matching		
	Treated (mean)	Untreated (mean)	P-value for Difference	Treated (mean)	Untreated (mean)	P-value for Difference
Firm Size	21.80	21.48	0.369	21.80	21.77	0.916
Firm Age	2.32	2.45	0.172	2.32	2.33	0.927
Leverage	0.52	0.60	0.881	0.52	0.52	0.933
Growth Opportunity	3.12	3.86	0.828	3.12	3.21	0.925
State Owned	0.00	0.18	0.136	0.00	0.00	1
Executive Ownership	0.03	0.00	0.000***	0.03	0.00	0.057
Duality Dummy	0.90	0.86	0.718	0.90	0.93	0.714
Board Independence	0.34	0.36	0.169	0.34	0.34	0.823
Supervisory Board	1.51	1.59	0.323	1.51	1.52	0.873
Ownership Concentration	0.11	0.17	0.155	0.11	0.12	0.877
Manufactory	1.00	0.58	0.007***	1.00	1.00	1
Public Service	0.00	0.09	0.327	0.00	0.00	1
Real Estate	0.00	0.09	0.332	0.00	0.00	1
Conglomerate	0.00	0.16	0.167	0.00	0.00	1
Commerce	0.00	0.09	0.330	0.00	0.00	1

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Matching in 2008

Covariates	Before Matching			After Matching		
	Treated (mean)	Untreated (mean)	P-value for Difference	Treated (mean)	Untreated (mean)	P-value for Difference
Firm Size	23.17	21.55	0.008***	23.17	22.40	0.225
Firm Age	2.75	2.54	0.124	2.75	2.77	0.893
Leverage	0.55	0.76	0.933	0.55	0.53	0.881
Growth Opportunity	1.58	1.29	0.889	1.58	1.87	0.689
State Owned	0.00	0.14	0.414	0.00	0.00	1
Executive Ownership	0.00	0.00	0.842	0.00	0.00	0.331
Duality Dummy	1.00	0.87	0.432	1.00	1.00	1
Board Independence	0.34	0.36	0.509	0.34	0.36	0.394
Supervisory Board	1.49	1.58	0.453	1.49	1.49	0.996
Ownership Concentration	0.06	0.17	0.071*	0.06	0.11	0.253
Manufactory	0.50	0.58	0.742	0.50	0.33	0.522
Public Service	0.00	0.09	0.536	0.00	0.00	1
Real Estate	0.25	0.09	0.244	0.25	0.33	0.745
Conglomerate	0.00	0.16	0.387	0.00	0.00	1
Commerce	0.25	0.09	0.249	0.25	0.33	0.745

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Matching in 2009

Covariates	Before Matching			After Matching		
	Treated (mean)	Untreated (mean)	P-value for Difference	Treated (mean)	Untreated (mean)	P-value for Difference
Firm Size	22.46	21.67	0.056	22.46	21.83	0.099*
Firm Age	2.49	2.62	0.111	2.49	2.63	0.130
Leverage	0.56	0.75	0.890	0.56	0.53	0.741
Growth Opportunity	1.92	-2.43	0.948	1.92	3.89	0.205
State Owned	0.00	0.09	0.311	0.00	0.00	1
Executive Ownership	0.00	0.00	0.931	0.00	0.00	0.835
Duality Dummy	0.70	0.86	0.132	0.70	0.70	0.983
Board Independence	0.37	0.36	0.503	0.37	0.37	0.855
Supervisory Board	1.47	1.57	0.161	1.47	1.53	0.414
Ownership Concentration	0.11	0.16	0.190	0.11	0.13	0.670
Manufactory	0.30	0.58	0.072	0.30	0.32	0.905
Public Service	0.10	0.09	0.890	0.10	0.20	0.456
Real Estate	0.10	0.09	0.875	0.10	0.01	0.053*
Conglomerate	0.40	0.16	0.038**	0.40	0.37	0.871
Commerce	0.10	0.09	0.875	0.10	0.10	0.991

* $p<0.1$, ** $p<0.05$, *** $p<0.01$